JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

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CHARLES H. ROGERS.

Dean Rogers served as Local Secretary for the Minneapolis meeting in 1938, and as Chairman of the House of Delegates of the ASSOCIATION for 1938–1939 and was elected President of the American Association of Colleges of Pharmacy for 1939–1940 during the recent meeting in Atlanta.

Dr. Rogers was born in Bellville, Ill., on May 28, 1889, and received his preliminary education and experience in that city; he graduated from the St. Louis College of Pharmacy in 1910; received the degree of B.S. in 1913 from the University of Michigan, and M.S. in 1915 and Sc.D. in 1918 from the University of Minnesota.

Pharmaceutical education has occupied Dr. Rogers' attention to a great extent. From 1910 to 1913 he served as Assistant in Pharmaceutical Chemistry, University of Michigan; from 1913 to 1914 as Instructor in Chemistry, University of Minnesota; and from 1914 to 1917, as Associate Professor and Head of the Department of Pharmacy, University of West Virginia. Since that time he has been connected with the College of Pharmacy, University of Minnesota as Professor and Head of the Department of Pharmaceutical Chemistry, 1917 to 1936, and as Dean and Professor of Pharmaceutical Chemistry from 1936.

Dr. Rogers has also served as a consulting chemist; is the author of a textbook on Inorganic Pharmaceutical Chemistry and co-author, with O. Gisvold, of "The Chemistry of Plant Constituents"; he has contributed many scientific and professional articles; and has been a Major in the Chemical Warfare Service Reserves since 1936. He holds membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, Minnesota Pharmaceutical Association, American Chemical Society, American Association for the Advancement of Science, Minnesota Academy of Sciences, Sigma Xi, Rho Chi, Phi Lambda Upsilon, Phi Delta Chi, Alpha Chi Sigma and Acacia. He is a Presbyterian, a Mason, a member of the Campus Club and of the Midland Hills Country Club.

Dr. Rogers and Miss Edith Mae Blood of Freeport, N. Y., were married on August 10, 1913; have two sons, Charles Thomas and Robert Gifford; and make their home in Minneapolis.

EDITORIAL

E. G. EBERLE, EDITOR EMERITUS. E. F. KELLY, ACTING EDITOR.

THE ATLANTA MEETING—AUGUST 20–26, 1939.

THE ATTENDANCE at each meeting and the interest in the work of the ASSOCIATION and of its affiliated organizations has increased steadily in recent years. The Atlanta meeting was a notable occasion in attendance, particularly of retail pharmacists, in the work accomplished and in the delightful entertainment provided by Local Secretary Wilson and his associates, including very comfortable weather. Richmond, Va. was chosen as the place for the 1940 meeting which will be held early in May rather than in August on account of the U. S. P. Convention.

The American Association of Colleges of Pharmacy and the National Association Boards of Pharmacy met on Monday and Tuesday. President Serles of the former association urged that the teaching institutions and their faculties critically examine themselves in the light of the recent rapid progress in pharmaceutical education and prepare to meet the new duties and responsibilities. President Cook of the Boards asked that the controversial question of the assistant pharmacist be dealt with constructively and uniformly by the states and that thought be given also to working out a "common objective" through the coöperation of all branches of Pharmacy, emphasizing the importance of close coöperation between Medicine and Pharmacy. Both associations made real progress in dealing with the problems of pharmaceutical education and registration.

The A. PH. A. began its program on Tuesday evening. There was a constant succession of meetings, morning, afternoon and evening except on Wednesday evening, when the Joint Banquet was held. Several sections met at the same time and their programs were so arranged that one could attend the session of his choice.

President Lascoff's address opened the meeting on Tuesday evening. After discussing the more important pharmaceutical problems, President Lascoff submitted seven recommendations. The more important of these were: that a study be made of the present possibilities of enacting constitutional legislation which will restrict the ownership of drug stores to registered pharmacists; that a systematic effort be made to have Pharmacy represented on state and local boards of health; and that special consideration be given to ways and means of bringing the medical and pharmaceutical professions into closer coöperation in dealing with questions of mutual interest, with particular reference to the socialization of the medical professions, the greater use of official preparations and in other helpful ways.

Governor E. D. Rivers of Georgia, followed with an address on "Public Health," which was an outstanding feature of the meeting. He showed an unusual grasp of the importance of a well-organized health program in each state and of the basic part which pharmacists can play in carrying out such a program and in building public support for it.

Reference should also be made to forceful addresses by Chancellor Sanford of the University System of Georgia on "Pharmacy of Tomorrow," by Dean Cocking of the University of Georgia on "The Pharmacist as an Education Influence in Community Life," and by Herbert M. Skinner, former President of the Pharmaceutical Society of Great Britain and an Honorary Member of the A. PH. A., on "The Place of Pharmacy in Health Insurance in England." Chairman Rogers

delivered a forceful address at the first session of the House of Delegates, dealing with the duties of delegates particularly those representing the state associations, the membership of the ASSOCIATION, legislation, the socialization of medical services, pharmacists' unions and more effective publicity for the various activities carried on by the ASSOCIATION.

Approximately two hundred papers, reports, etc., were considered during the week and it is manifestly impossible to even review them by title. An examination of the titles as given in the program which was printed in the July issue of the JOURNAL will illustrate their scope and character. The following are outstanding.

SOCIALIZATION OF HEALTH SERVICES.

This subject was discussed from many angles and the ASSOCIATION reaffirmed the position taken last year and also endorsed a strong statement made in the report of the Committee on Social and Economic Relations with respect to the furnishing of drugs and medicines in health programs. It was insisted that Pharmacy's interest in any program should be recognized and that the public should have the free choice of the pharmacist who should serve them. In this connection Mr. Skinner's address gave first-hand information about how Pharmacy has been affected by the Health Program in England.

FOOD, DRUG AND COSMETIC LEGISLATION.

There was difference of opinion about the wisdom of enacting at this time state legislation similar to the Federal Act. There was general approval, however, of the service the ASSOCIATION gave in furnishing a draft of a uniform state act with necessary explanations for the guidance of the states. The state associations were urged to give attention to the enactment of legislation of this type and the special committee which drew up the proposed state act was continued as a committee on information to work with the interested state associations through the Secretary.

MODERNIZATION OF PHARMACY LAWS.

The committee which drew up the model state pharmacy act reported that the draft had been submitted to the state boards of pharmacy and with some minor changes was now ready for the consideration of the state associations and others interested in modernizing their pharmacy laws. It is recognized that this draft contains some controversial provisions but it represents an honest effort to deal with the fundamental problems facing Pharmacy. This committee will also be continued and will coöperate with the state associations. Again there was general approval of the service the ASSOCIATION is rendering in this important activity.

RADIO ADVERTISING.

The Federal Communications Commission will be requested to provide for stricter regulation of the dissemination of medical advice over the radio. It was the sense of the ASSOCIATION that radio broadcasts dealing with health matters should be under the auspices of health professions or of Federal, State or Local authorities.

CONTINUATION COURSES FOR PHARMACISTS.

The schools and colleges of Pharmacy were commended for their efforts to provide such courses for practicing pharmacists and the state associations were urged to recommend to their members that they keep themselves abreast of the progress of Pharmacy through such courses.

DISTRIBUTION OF DRUGS AND MEDICINES.

The ASSOCIATION reiterated its conviction that a complete health service requires that all types of drugs and medicines be distributed by registered pharmacists. It was also recommended that prescriptions and drugs dispensed by physicians, dentists and veterinarians be brought under the regulations of state laws covering the labeling of these products.

NATIONAL FORMULARY.

A two-day session of the Committee on National Formulary was held to finish as far as possible its task of turning over to the new committee a practically complete manuscript of the N. F. with the object of issuing the Seventh Edition early in the coming decade. The new Committee composed of ten members was elected to serve from one to ten years each. Hereafter, one member will be elected annually, providing a continuous committee of revision. It was decided to elect a chairman of the Committee who will also serve at least for the present as Director of the Laboratory on a full-time basis, bringing to these important duties the full attention of the most available man to be found.

PUBLICATIONS.

It was decided to proceed with the proposed popular type of publication and to limit the present JOURNAL to the more scientific papers, reports, etc. The first issue of the new publication will appear about January 1, 1940, and both publications will be available to members for the present. President DuMez will edit the present JOURNAL and Secretary Kelly the new publication, for the year. It is expected that through this arrangement greater and more satisfactory publicity can be given to the activities of the A. PH. A. and of the State Associations, in the professional and scientific fields.

U. S. P. AND N. F. PROMOTION.

A meeting of the state committees having this important activity in charge was held with plans made to improve and expand the program. A very fine exhibit illustrated the work being carried on in a number of states and it is planned to have a much more comprehensive exhibit next year.

AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION.

The Council submitted a comprehensive report of the progress made in examining the schools and colleges of Pharmacy which have applied for accreditment by the Council. It is expected that the list of accredited institutions will be issued about January 1, 1940. The Council was recently incorporated in order to place it on a more permanent basis.

HOSPITAL PHARMACY.

A great deal of attention was given to the improvement of pharmaceutical service in hospitals and other institutions. The American Medical Association, the American College of Surgeons and the American Hospital Association have been very helpful in this effort. The Section on Hospital Pharmacy is engaged in a survey of hospital pharmacy, in organizing hospital pharmacists and in compiling a model hospital formulary.

PROFESSIONAL PHARMACY.

Last year a meeting of professional pharmacists was held which was expanded

to a conference at the Atlanta meeting. This rapidly-growing group wish to have the opportunity annually to consider their individual problems as are the hospital pharmacists and other groups, without interfering with the general program. After a very enthusiastic session a strong committee was appointed to study the form of organization, etc., and to arrange for a larger meeting next year. This was one of the most important developments during the Atlanta meeting.

STUDENT BRANCHES.

There has been a great expansion of Student Branches of the ASSOCIATION in recent years and representatives of a number of these branches met for the first time in Atlanta to consider their problems. It was arranged to make such a meeting a permanent feature each year.

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

This conference had so many important problems that it was in almost continuous session for three days. These problems dealt mainly with the administration of state and local associations and illustrates the wide variety of subjects considered at an A. PH. A. meeting.

CONFERENCE OF LAW ENFORCEMENT OFFICIALS.

This group held two interesting sessions devoted to the general purpose of promoting the enforcement of the laws affecting Pharmacy with particular reference to the retail pharmacists.

Attention was also given to Pharmacy Week, to the status of pharmacists in the government service, to the revision of the pharmaceutical syllabus, to state and national legislation, affecting professional pharmacy, and many other subjects.

The reports of the secretary and treasurer of the ASSOCIATION were of particular interest. The former reviewed the current activities of the ASSOCIATION including the Reference Library, the Historical Museum, and the A. PH. A. Laboratory and the services these divisions render. The Treasurer reported a further gain in the net work of the ASSOCIATION which is now approximately $750,000.

The Ebert Prize was awarded to Dr. B. V. Christensen and the first Kilmer Prize to Guilford C. Gross, a recent graduate of the School of Pharmacy of the South Dakota State College, who came to the meeting to receive the award. After the awards and the approval of resolutions (which follow) the meeting closed with the installation of officers and the inaugural address of President DuMez in which he outlined the administration's program for the coming year. First will be the appointment of a committee to formulate a long-time program of policy for the ASSOCIATION to follow in carrying out the objectives set forth in Article 1 of its Constitution. Next will be the launching of a movement to bring about a better understanding and a closer relationship between Medicine and Pharmacy. Attention will also be given to developing more satisfactory and more effective exhibits by the ASSOCIATION, to launching the popular JOURNAL, to building up the membership, and to the promotion of the established activities of the ASSOCIATION.

In order to carry out the program as completely as possible, in the short ASSOCIATION year, President DuMez gave prompt attention to the appointment of committees and delegates, and a list of these will be found in the ASSOCIATION roster in this issue of the JOURNAL. A list will also be found of the officers installed at Atlanta and of those nominated for election by a mail ballot of the members later.

As a whole, the meeting was a real contribution to pharmaceutical progress.—E. F. K.

NATIONAL PHARMACY WEEK MESSAGE.

The time set aside for the observance of National Pharmacy Week this year is October 22nd to the 28th.

The annual observance of this week begun fifteen years ago, is now almost an established custom with us and is being looked forward to by the public from year to year with increasing interest. As President of the AMERICAN PHARMACEUTICAL ASSOCIATION, I, therefore, call upon all pharmacists, the members of the teaching staffs of our colleges of pharmacy, the members of state boards of pharmacy, the personnel of the drug industry and all others concerned to take an active part in making the observance of this week, dedicated to Pharmacy, one which will serve to the fullest possible extent to accomplish the purpose for which it was established.

The purpose for which National Pharmacy Week was established, as most of you will recall but which is restated here for the information of the newcomers to our ranks and for those who may have failed to grasp its full significance, is to provide an opportunity for the pharmacists of the Nation to unite each year in one grand effort to bring to the attention of the public information with regard to the nature and extent of the professional services rendered by them and to point out the importance of the drug store to the community as a public health station. Both of these objectives have been proven by the test of trial to be sound and their attainment worthy of your best effort.

The effort which you will be required to put forth to make the observance of National Pharmacy Week a success this year does not necessarily call for any great imagination on your part or for unusual material accessories and it need not be unduly laborious. The practice of Pharmacy is a time-honored profession and there is a wealth of material on the history of its development for you to draw upon in the preparation of community addresses and radio broadcasts. The materials for display are at hand in your drug stores and the colleges of pharmacy. All that is required of you is to assemble and arrange them in such a way that they will convey your message to the public.

If the observance of National Pharmacy Week does not accomplish the laudable purpose for which it was established, it will be because we, pharmacists, have failed to do our share of what is required to make it a success. We must not fail, so let us all put our shoulders to the wheel and put National Pharmacy Week across in a big way again this year.

A. G. DUMEZ,
President.

OFFICERS AND NOMINEES.

The following were nominated during the recent Atlanta meeting for the respective officers named:

PRESIDENT.

F. E. BIBBINS, *Manufacturing Pharmacist*, Indianapolis, Indiana.

CHARLES H. EVANS, *Retail Pharmacist*, Warrenton, Georgia.

A. L. I. WINNE, *Secretary*, Virginia Pharmaceutical Association and Board of Pharmacy, Richmond, Va.

FIRST VICE-PRESIDENT.

JOSEPH B. BURT, *Professor*, University of Nebraska, and *Editor, Pharmaceutical Archives*, Lincoln, Nebraska.

I. W. ROSE, *Retired Retail Pharmacist, Professor*, Dispensing, University of North Carolina, Chapel Hill, N. C.

H. A. K. WHITNEY, *Hospital Pharmacist*, Ann Arbor, Mich.

SECOND VICE-PRESIDENT.

HENRY GREGG, JR., *Retail Pharmacist*, Minneapolis, Minn.

AQUILLA JACKSON, *Deputy Drug Commissioner of Maryland*, Baltimore, Md.

EMERSON D. STANLEY, *Retail Pharmacist*, Madison, Wis.

MEMBERS OF THE COUNCIL.

F. J. CERMAK, *Retail Pharmacist*, Cleveland, O.; P. H. COSTELLO, *Retail Pharmacist*, Cooperstown, N. Dak.; H. A. B. DUNNING, *Retail Pharmacist and Pharmaceutical Manufaciurer*, Baltimore, Md.; C. B. JORDAN, *Dean*, Purdue School of Pharmacy, La Fayette, Ind.; R. A. KUEVER, *Dean*, University of Iowa, Iowa City, Ia.; H. A. LANGENHAN, *Former Professor*, College of Pharmacy, Seattle, Wash.; R. A. LYMAN, *Dean*, School of Pharmacy, Lincoln, Nebr.; E. J. PROCHASKA, *Retail Pharmacist*, Pine City, Minn.; R. C. WILSON, *Dean*, School of Pharmacy Athens, Ga.

The names of these candidates will be submitted by mail about October first to the members of the ASSOCIATION, with a ballot, for the election of the President, the First Vice-President, the Second Vice-President, all to serve one year, and three Members of the Council, to serve three years. Those elected will be installed during the closing session of the 1940 meeting which will be held in Richmond, Va.

The officers elected by mail ballot last fall and installed during the Atlanta meeting are: A. G. DUMEZ, Baltimore, Md., *President;* F. O. Taylor, Detroit, Mich., *First Vice-President;* F. J. CERMAK, Cleveland, O., *Second Vice-President;* H. C. Christensen, Chicago, Ill.; R. P. FISCHELIS, Trenton, N. J., and R. L. SWAIN, New York City, *Members of the Council.*

During the Atlanta meeting the following officers were elected to serve during the year 1939–1940; J. W. GAYLE, Frankfort, Ky., *Honorary President;* E. F. KELLY, Washington, D. C., *Secretary;* C. W. HOLTON, Essex Fells, N. J., *Treasurer;* M. N. FORD, Columbus, O., *Chairman,* and E. C. SEVERIN, Philip, S. Dak., *Vice-Chairman of the House of Delegates.*

The first issue of "The National Capital Pharmacist," official organ of the District of Columbia Pharmaceutical Association, has just arrived. Congratulations are extended to the Association and Editor W. Paul Briggs.

THE NEW "SECOND U. S. P. XI SUPPLEMENT" AVAILABLE SEPTEMBER 1.

It has been learned that the Pharmacopœial Supplement will be off the press in a few days, and stocks are to be shipped to the regular U. S. P. sub-agents throughout the country so that it may be released on September 1.

The "Second U. S. P. XI Supplement" includes new monographs for Ascorbic Acid, Cyclopropane, Mandelic Acid, Methylrosaniline Chloride, Nicotinic Acid, Purified Cotton, Soluble Pentobarbital, Sulfanilamide, Surgical Gut or "Catgut," Thiamine Hydrochloride, Tribasic Calcium Phosphate, Tribasic Magnesium Phosphate, Natural Vitamin A in Oil and Natural Vitamins A and D in Oil, official in the U. S. P. for the first time. Two of these substances, Tribasic Calcium Phosphate, and Methylrosaniline Chloride, were in the National Formulary but these new U. S. P. standards now supersede the corresponding standards of the N. F. VI.

The Second Pharmacopœial Supplement also includes a revision of 85 of the monographs of the original U. S. P. XI, the revision of Antipneumococcic Serum including the recognition for the first time of Types II, V, VII and VIII, under Tetanus Antitoxin, the use of animals other than the horse are permitted, while under Diphtheria Toxoid, the Alum Precipitated form is given official recognition. It also contains a new bio-assay method for Thiamine Hydrochloride (Vitamin B_1). Improved assays for Vitamin A and Vitamin D are also given.

An important feature of the Second Supplement is the cumulative index which lists all U. S. P. titles and indicates where the present official monograph now in force may be found. This index emphasizes the fact that the "U. S. P. XI" now consists of three volumes—the original U. S. P. XI, which became official on June 1, 1936, the "First U. S. P. XI Supplement" official December 1, 1937 and the "Second U. S. P. XI Supplement" which will become official January 1, 1940, with the exceptions indicated below.

In the new Supplement the following exceptions are made for the revised monographs for Cod Liver Oil and Nondestearinated Cod Liver Oil and for the new monograph providing standards for "Surgical Gut" or "Catgut." These three texts do not become official until July 1, 1940, six months additional time being allowed for the adjustment of labels and existing stocks.

The new requirement that the regular bottles of Solution of Magnesium Citrate require that they shall contain "Not less than 340 cc. and not more than 360 cc.," and the new standards for U. S. P. "Absorbent Cotton," which require that it shall have at least a specified minimum fiber length and be sterile, are important features of this Supplement.

To insure prompt delivery of the Supplements, orders should be sent, accompanied by a check or money order, to the General Agent, The Mack Printing Company, Easton, Pennsylvania.

The price of the "First U. S. P. XI Supplement" is $1.00 prepaid, and for the "Second U. S. P. XI Supplement," which is considerably larger, $1.50, prepaid.

A substantial, spring-back cover, serving as a single binder for all U. S. P. Supplements is also available. The binder sells for $1.50.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SUB-SECTION ON PHARMACY (N-1) PROGRAM.

The American Association for the Advancement of Science will meet in Columbus, Ohio, December 27th to January 2nd. The Sub-Section on Pharmacy Program Committee is planning two sessions at which papers pertaining to any original scientific work in Pharmacy may be presented. Papers should be prepared so that not more than fifteen minutes will be required for their presentation. Authors of papers are invited to submit titles of papers to the Chairman of the Program Committee who will be pleased to furnish further information.

GLENN L. JENKINS, *Chairman, Program Committee.*

INTERIM REVISION ANNOUNCEMENT NO. 1. NATIONAL FORMULARY, SIXTH EDITION.

By action of the Committee on National Formulary and with the approval of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION, the following monographs of the National Formulary, Sixth Edition, are revised, as indicated below; these revisions will become official on December 1, 1939.

CORPUS LUTEUM.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Corpus Luteum is to be dispensed when 'Corpus Luteum Extract' or 'Corpora Lutea' is called for, unless it is evident that a sterile solution of the water-soluble principles of Corpus Luteum is intended."

OVARIUM.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Ovary is to be dispensed when 'Ovarian Extract,' 'Extract Ovarian,' 'Extract Ovarian Substance,' 'Extract Ovarian Desiccated' and 'Extract Ovarian Substance Desiccated' are called for unless it is evident that a sterile solution of the active principles of Ovary is intended."

PITUITARIUM ANTERIUS.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Anterior Pituitary is to be dispensed when 'Extract of Anterior Pituitary,' 'Extract of Pituitary Anterior Lobe,' 'Extract of Pituitary Body Anterior Lobe,' 'Extract of Desiccated Pituitary Anterior Lobe' are called for, unless it is evident that a sterile solution of the active principles of Anterior Pituitary is intended."

PITUITARIUM TOTUM.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Whole Pituitary is to be dispensed when 'Pituitary Extract,' 'Extract Pituitary Substance,' 'Extract Pituitary Body,' 'Extract Pituitary Desiccated,' 'Extract Pituitary Substance Desiccated' are called for unless it is evident that a sterile solution of the active principles of Whole Pituitary is intended."

RESIDUUM OVARII.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Ovarian Residue is to be dispensed when 'Ovarian Residue Extract' is called for, unless it is evident that a sterile solution of the active principles of Ovarian Residue is intended."

SUPRARENALUM.

Delete the first paragraph of this monograph, the deletion reading as follows:

"Note: Suprarenal is to be dispensed when 'Suprarenal Extract' or 'Adrenal Extract' is called for, unless it is evident that a sterile solution of the active principles of Suprarenal is intended."

A word of explanation as to the purpose of this interim revision may be in order.

First, When these items first became official in National Formulary VI, as of July 1, 1936, they were found in commerce under a great variety of names. These trade names frequently included the word "Extract."

Second, In the pharmaceutical sense these desiccated glandular powders are not "extracts."

Third, These monographs have been official for more than three years, and the use of the official English titles or official synonyms is now very general in designating these products in commerce.

Fourth, These notes, as found in the several monographs, are rather indefinite in meaning.

Fifth, In view of the fact that these notes have apparently served their original purpose the N. F. Committee approved of their prompt deletion from these monographs.—E. N. GATHERCOAL, *Chairman, National Formulary Committee.*

RESOLUTIONS AND RECOMMENDATIONS ADOPTED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION AT ITS EIGHTY-SEVENTH ANNUAL MEETING IN ATLANTA, GA., AUGUST 20–26, 1939, UPON RECOMMENDATION OF THE HOUSE OF DELEGATES THROUGH THE COMMITTEE ON RESOLUTIONS.

THE PRESIDENT'S ADDRESS.

The AMERICAN PHARMACEUTICAL ASSOCIATION desires to commend President Lascoff for the thorough study he has evidently given to the problems of our profession as evidenced by his comprehensive and thought-provoking address. We likewise wish to commend the earnestness of purpose with which he has discharged the duties of the presidential office. He has labored diligently and well to bring the professional activities of the practicing pharmacist to the attention of other professions and to the public and he has done much to encourage the members of our own profession to give greater thought and attention to the promotion of prescription practice.

No. 1. (1) "That a study be made of the present possibilities of enacting constitutional legislation which will restrict the ownership of drug stores to registered pharmacists."

We approve Recommendation No. 1 and recommend that the House of Delegates be empowered to appoint a committee of five to make the study.

(2) "That a systematic effort be made to interest the pharmacists of the several states in securing legislation which will give Pharmacy membership on the state boards of health."

We approve Recommendation No. 2 and recommend that the duties of the Committee on Pharmacists in the Government Service be expanded to include this function.

(3) "That special consideration be given to ways and means of bringing the medical and pharmaceutical professions closer together, to the end that they may actively coöperate in questions of mutual interest, with particular reference to the socialization of the medical professions, the greater use of official preparations and in other helpful ways, and that a committee be appointed to acquaint the American Medical Association with the purpose of the AMERICAN PHARMACEUTICAL ASSOCIATION and to seek its aid in effectuating a workable, practical program for cooperation between these two great professional organizations."

We approve the objectives set forth in Recommendation No. 3 and recommend that steps be taken by the AMERICAN PHARMACEUTICAL ASSOCIATION either through its Committee on Professional Relations or through a special committee of five members to contact other national associations in the public health field for the purpose of creating a National Inter-Professional Council.

(4) "That a study be made of the possibilities of the Recipe Book and that sound promotional plans be adopted bringing it to the attention of pharmacists and the drug industry."

We approve Recommendation No. 4 and recommend that it be referred to the Council Committee to Develop Advertising for the Pharmaceutical Recipe Book and the National Formulary.

(5) "That the ASSOCIATION lend its efforts to the development of professional pharmacy as this is expressed in hospital pharmacy, the Conference of Professional Pharmacists and in all other pharmaceutical endeavors which are aimed at stimulating deeper interest in Pharmacy as a public health profession."

As one of the objects of the AMERICAN PHARMACEUTICAL ASSOCIATION stated in the Constitution, Art. 1, Sec. 3, covers the general purpose of Recommendation No. 5, the Committee considers it unnecessary to act upon this recommendation.

(6) "That determined effort be made to make the observance of Pharmacy Week of greater significance each year and that the Committee on Pharmacy Week be impressed with the necessity of so presenting Pharmacy Week to pharmacists and especially retail pharmacists, as to stir up their interest in its observance as a matter of professional pride and obligation."

We approve Recommendation No. 6 and recommend that it be referred to the Committee on National Pharmacy Week.

(7) "That continued studies be made of the membership problems of the ASSOCIATION with special reference to ways and means of securing a large proportion of the graduates in Pharmacy as members, as well as ways and means of directing the attention of retail pharmacists to the work of the ASSOCIATION and in pointing out its application to the everyday work which Pharmacy carries on."

We approve Recommendation No. 7 and recommend the publication of the names of District and State membership chairmen and committees appointed in accordance with the by-

laws in the roster of the ASSOCIATION. We further recommend that the Committee on Membership study the question of membership qualifications with the view of setting up suitable standards for membership.

ADDRESS OF THE CHAIRMAN OF THE HOUSE OF DELEGATES.

We believe that the address of Chairman Charles H. Rogers, of the House of Delegates, ranks with the best annual messages that have been delivered to this House. We particularly commend his analysis of the organizational defects of American Pharmacy and his presentation of the problems confronting us with respect to membership, legislation, socialization of medical services, pharmacists' unions and publicity for the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION. While he did not list a series of specific recommendations, the address pointed to the necessity for action along various lines. The following resolutions are the result of such suggestions and also of experience gained in transacting the business of the House of Delegates at this convention.

We recommend that copies of the Chairman's address and the resolutions passed at this meeting be furnished promptly to each delegate.

No. 2. Resolved, that our delegates to the National Drug Trade Conference be instructed to propose to the Conference at its next annual meeting, a thorough study of the possibility of creating a National Council encompassing all pharmaceutical interests, for the purpose of representing American Pharmacy on occasions and in endeavors requiring a united front for the benefit of the pharmaceutical profession and the drug industry as a whole.

No. 3. Resolved, that the editor of the appropriate JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be requested to set aside adequate space in each issue of the JOURNAL for educational publicity of the National Formulary, Recipe Book and other publications, and that such educational publicity be directed to the practicing pharmacists of the nation in an endeavor to increase the usefulness and application of these publications to the profession in general.

No. 4. Resolved, that efforts be made to facilitate the business of the House of Delegates by requiring officers and Committes to present their reports and recommendations sufficiently in advance of the annual convention to permit of their printing in the appropriate JOURNAL OF THE ASSOCIATION so that the reports and recommendations may be studied by the delegates in advance of action thereon and also to permit the delegates to sound the opinions of their constituent bodies on the proposals to be voted on.

No. 5. Resolved, that the incoming officers of the House of Delegates be urged to instruct the members of the House who may not have had previous experience in the business of the ASSOCIATION as to their duties and the method outlined in the Constitution and By-Laws of the AMERICAN PHARMACEUTICAL ASSOCIATION and of the House of Delegates for transacting the business of the House.

No. 6. Resolved, that the incoming officers of the House of Delegates be charged with the duty of providing facilities for expediting the business of the House along the following lines:

(*a*) Providing for more satisfactory identification of delegates by supplying a badge or other insignia bearing the word "delegate" to accredited voting delegates.

(*b*) By setting aside a section of seats in the front of the meeting room exclusively for the use of delegates.

(*c*) By arranging for a roll call of delegates and an attendance record at each session of the House, the same to be printed in the proceedings of the House, which are furnished to the members for the record of the Association they represent.

(*d*) By furnishing lists of accredited delegates to the members of the House in advance of the meeting, if possible, but not later than the first general session of the House.

(*e*) By providing for more satisfactory facilities for taking secret ballots, and roll call votes.

No. 7. Resolved, that the Committee on By-Laws be requested to give consideration to the possibility and advantages of providing for the election of delegates for terms of two years.

. . . . . .

No. 8. Resolved, that the statement proposed by the Committee on Social and Economic Problems to indicate the present position of the AMERICAN PHARMACEUTICAL ASSOCIATION on the subject of Socialization of Medical Services be approved and made public, as follows:

No. 9. WHEREAS, the distribution of drugs at state expense seems unnecessary and inconsistent except in cases which fall into the two following general categories: (1) unusually expensive drugs required to save lives of those unable to meet the cost because of income limitations; (2) drugs used in combating epidemics or diseases with serious social consequences, and

WHEREAS, the cost of drugs in the treatment of routine or even serious ailments, unless continued over unusually long periods, is not catastrophic, and

WHEREAS, the need for withdrawing any considerable portion of the activity now exercised in the distribution of drugs and medicines from the recognized and legally regulated sources, namely, the pharmacies of the United States, is unnecessary and may even be prejudicial to public convenience and welfare, be it

Resolved, that in the interest of the best type of health service the principle of free choice of drugs by the physician within the limits of the official and otherwise approved materia medica, and free choice of pharmacist by the patient should prevail in any State or local System of supplying medical care at the complete or partial expense of the State.

No. 10. Resolved, that the Postoffice Department of the United States be requested to design and issue a stamp commemorating the 120th anniversary of the origin of the United States Pharmacopœia, which occurs in 1940.

No. 11. Resolved, that the Federal Communications Commission be requested to provide for stricter regulation of the dissemination of medical advice over the radio. It is the sense of the ASSOCIATION that radio broadcasts dealing with health matters should be under the auspices of recognized associations of the health professions or Federal, State or local health departments. The ASSOCIATION further suggests to the Federal authorities and to the National Broadcasting organizations, that the sponsorship of all programs touching upon health matters be made public and that the qualifications of announcers and spokesmen for firms giving medical advice be made known in connection with such programs.

No. 12. Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION offer its encouragement and approval of the efforts of colleges of pharmacy to provide refresher courses, seminars and conferences on the professional and economic phases of pharmaceutical practice to graduate pharmacists. The ASSOCIATION looks with favor upon the continuation and expansion of activities in this direction and recommends to the state pharmaceutical associations the importance of urging their members to keep themselves abreast of the progress of Pharmacy through active participation in such courses, seminars and conferences.

No. 13. Resolved, that the Boards of Pharmacy and State Pharmaceutical Associations be advised of the pioneering efforts of the Board of Pharmacy of the state of Wisconsin, under the George-Dean Act, to the end that the educational facilities thus afforded to practicing pharmacists be made available to greater numbers of members of our profession.

No. 14. Resolved, that the State Pharmaceutical Associations be urged to give prompt attention to the enactment of state laws bringing the regulation of intra-state commerce in drugs, devices and cosmetics into conformity with the Federal Food, Drug and Cosmetic Act, and that the uniform state Food, Drug and Cosmetic Act prepared by the Committee of the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION and endorsed by the National Drug Trade Conference, be commended to the various states as a working model for such intra-state regulations.

No. 15. Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION reiterate its profound conviction that a complete public health service requires the distribution of all types of drugs and medicines, regardless of classification, under the supervision of registered pharmacists; and

That it is the sense of this ASSOCIATION that regulations covering the labeling of prescriptions and other drugs under State drug law, should be extended to include prescriptions and drugs dispensed by physicians, dentists and veterinarians.

No. 16. Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION record its sincere appreciation of the valuable assistance given by the Historical Records Survey of the Works Progress Administration in the cataloguing and arrangement of the reference library and in the study of the historical records of the AMERICAN PHARMACEUTICAL ASSOCIATION. It is the sense of the ASSOCIATION that the coöperation of the Historical Records Survey in these important activities has resulted in making the Library of the AMERICAN PHARMACEUTICAL ASSOCIATION more valuable to the members of the ASSOCIATION and in bringing the Library and the Historical records of the ASSOCIATION to the favorable attention of research workers in other fields, thus extending the usefulness of the ASSOCIATION'S facilities into other fields of endeavor.

No. 17. Resolved, that the National Bureau of Standards be commended for undertaking the establishment and development of acidity or p_H standards, test and control methods and calibrations, which data is of basic importance in the preparation, standardization and preservation of drugs, medicines and medical supplies, and that the Bureau of the Budget and the Congress be urged to provide adequate funds for this purpose.

No. 18. Resolved, that the ASSOCIATION hereby expresses to the Civil Service Commission of the Federal Government its appreciation of the provisions recently made for the examination of pharmacists who desire to enter the service of the government through the Civil Service.

No. 19. Resolved, that we express to Chancellor S. V. Sanford of the University System of Georgia, our appreciation of his splendid address entitled "Pharmacy of Tomorrow." His approach to the problems of our profession and the encouragement offered for the future, in his estimate of the place of Pharmacy in the general scheme of medical care, give evidence of the interest of the University System of Georgia in the promotion of pharmaceutical education.

No. 20. Resolved, that we express to Honorable E. D. Rivers, Governor of Georgia, our profound appreciation for his participation in the program of the First General Session of this ASSOCIATION, and that we express to him our admiration of the evident study which he has given to the problem of providing public health services to all the people, and of his grasp of the significance of Pharmacy in the general public health program of the state and nation. The thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION are hereby expressed to Governor Rivers, not only for his helpful participation in the program of our convention, but for the outstanding contribution made by him in his address in focusing public attention upon the important part which is played by the pharmacies and pharmacists of the nation in the health care of our people.

No. 21. Resolved, that the thanks and appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION be extended to the *Atlanta Constitution*, the *Atlanta Journal* and the *Atlanta Georgian* for the intelligent and extensive publicity given to the meetings of our ASSOCIATION throughout the convention week.

No. 22. Resolved, that the thanks and appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION be extended to the Atlanta Biltmore Hotel, its officers and personnel, for the unfailing courtesy and complete service extended to the officers and members of our ASSOCIATION, in connection with the convention arrangements and the housing and entertainment of our members throughout the convention week.

No. 23. Resolved, that the thanks of the AMERICAN PHARMACEUTICAL ASSOCIATION be extended to Mr. DeSales Harrison, and his associates, for their generous and delightful hospitality extended throughout the convention week.

No. 24. Resolved, that the thanks and appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION be extended to Dean R. C. Wilson, the local Convention Secretary and all of his associates, and to the various convention committees and auxiliary committees which have labored so diligently in providing for the comfort and entertainment of the members of our ASSOCIATION throughout the convention. We desire particularly to compliment the local Convention Secretary and his associates upon the high plane on which the entertainment features were carried out and upon the delightful hospitality which has been extended so generously by all concerned.

SECTIONS

BOARD OF REVIEW OF PAPERS (SCIENTIFIC SECTION).—*Chairman*, F. E. Bibbins; H. M. Burlage, J. L. POWERS, E. V. Lynn, C. O. Lee, L. W. Rising, L. W. Rowe, Heber W. Youngken, Ralph E. Terry, Carl J. Klemme.

CAPILLARY ANALYSIS OF CERTIFIED FOOD DYES.*

BY ABRAHAM TAUB[1] AND MARIO DE J. ORTEGA Y CANET.[2]

The application of capillarity to chemical analysis began in 1861 with the work of Schonbein (1) in differentiating natural products by use of filter strips, but it was not until 1909 that Goppelsroeder (2) applied the method extensively using a number of media besides paper. He named the procedure capillary analysis. Since then Kunz-Krause (3) introduced the method into Pharmacy, Platz (4) applied it to Homeopathy, and Lasseur and Marchal (5) to Bacteriology. Boutaric (6) and Freundlich (7) have made extensive investigations of the mechanism of capillary chemistry. Mulliken (8), as well as Schonbein and Goppelsroeder have attempted to apply the method to dyes but have admitted the lack of reliability of their procedures.

The present investigation was begun with the purpose of developing a shorter method of detecting and separating the certified food dyes. The more extended use of the certified dyes which will be made necessary by the recently enacted Food, Drug and Cosmetic Act, makes their rapid detection highly desirable.

An examination of present chemical methods of analysis of these dyes (9, 10) makes readily apparent the laborious technique involved in some of these, and the indefiniteness of conclusions obtained in others. The method involving successive dye extractions with selective immiscible solvents (11) at different p_H values is very lengthy and does not give complete separations. The method of spot testing on dyed animal and vegetable fibers (10) involving color reactions with different reagents lacks reliability. When mixtures of dyes are present, obscured and false color reactions make positive identification an almost hopeless task. It was felt that the method of capillary analysis offered possibilities of providing a more rapid and positive method of analysis of these dyestuffs.

To carry out the capillary analysis under controlled conditions, a special cabinet was built. This is shown, with front cover removed, in Fig. 1. The compact case, 41 x 11 x 32 cm. has been constructed so as to provide an hermetically sealed compartment when front and back glass plates have been bolted on. The metal frame is soldered at all joints. Rubber gaskets, 1 cm. thick, provide a seal between the frame of the case and the glass plates. An inlet and an outlet tube are connected in the interior to air diffusing chambers running lengthwise across top and bottom. A cross bar bears spring clips from which the capillarizing strips may be suspended. Set screws, specially sealed to prevent leakage of air, can be operated from outside the case after it is sealed, to raise or lower the strips into the 30-cc. beakers containing the dye solutions. The beakers are held in place by metal rings soldered to the bottom of the case. Paraffin covers, with slits 11 x 1 mm. were designed to prevent excessive evaporation of water from the dye solutions, and facilitate the control of humidity within the case.

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[2] Abstracted from a dissertation submitted by Dr. Ortega to the Graduate Faculty, Columbia University, College of Pharmacy, in partial fulfilment of the requirements for the degree of Doctor of Pharmacy.

Previous investigators, Heinrici (12) and Rojahn (13) have recognized the need of humidity control, but were unable by their methods to obtain sufficiently constant conditions. Too high a humidity causes diffuse capillary images. Too low a humidity gives capillary rises too short in height to permit adequate differentiation. A relative humidity of 60% (±5) was found to be optimum.

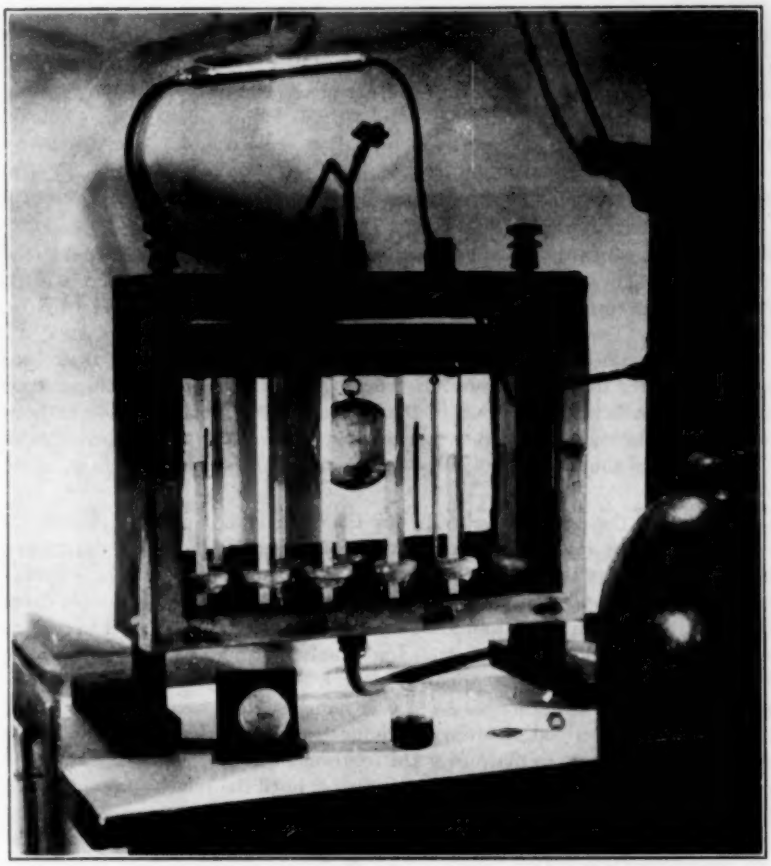

Fig. 1.

Since the rapid evaporation of water from the capillary strips would cause a 100% saturation of the air in a few minutes within the small compartment, provision for rapid removal of this moisture must be made. The use of drying agents within the case is of no value for rapidly reducing the humidity. The only satisfactory method is to pass a stream of air through the case, by vacuum or pressure pump, at a velocity sufficient to bring about the desired humidity.

The air which enters the case must first have its relative humidity reduced almost to zero if it is to be an effective drying agent. An attempt was made to adapt the method of Sweetman (14) who suggested controlling the humidity of air by passing it first through supersaturated salt solutions. A number of solutions listed in *International Critical Tables* (15) were tried. However, since large volumes of air are involved, the original moisture content of the air soon dilutes the salt solutions and upsets the equilibrium. It was found that a flow of approximately one liter of dry air per minute had to be passed through the case to maintain a fairly constant optimum humidity. Solid drying agents, capable of being regenerated, can be used, but a practical solution of the problem is to use compressed air, available commercially in tanks of 200 cu. ft. and having an extremely low moisture content. Regulating the flow of this air permits satisfactory humidity control within the case.

A wet-dry bulb hygrometer cannot be used since it gives off considerable water vapor, which would have a marked effect in the small space of the cabinet. A calibrated horse-hair hygrometer proved satisfactory. Grant (16) has shown this instrument to be sufficiently accurate.

Temperature fluctuations of a few degrees did not affect the reliability of the results. Room temperature was maintained at 24° C. ± 2. The air passing from the outlet tube was forced through 20 mm. of mercury to maintain a constant pressure.

The filter paper from which the capillary strips are made is Schleicher & Schüll No. 604. This was selected, in preference to No. 597 or 598, used by other investigators, because of its soft texture which permits rapid and uniform capillary penetration of solutions. The paper is cut into strips 1 cm. wide and 22 cms. long. This length was found sufficient since maximum height to which the dyes rose within the period of operation was 16 cms. The depth to which the capillary strips are immersed was found to have no effect upon capillary rise. For purposes of uniformity in measuring capillary rise, all strips were immersed 1 cm. below the surface of the liquids.

For the purposes of this investigation, the thirteen permitted water soluble coal tar food dyes[1] were selected. These dyes, described in Bulletin 1390 and Supplement 1 of the Department of Agriculture are termed certified when they comply with the standards set by the Food and Drug Administration. Government certified dyes were used throughout this work. These dyes are salts of acid dyestuffs. Their colored ions are negatively charged and their behavior as a group might be expected to be analogous. However the differences in their chemical composition is in most instances sufficient to encourage the idea that they would be differently affected by other substances in solution. It was therefore decided to adapt the work of investigators in other fields (17), (18), (19) of the influence of certain electrolytes and other substances, upon the capillary rise of these dyes.

In carrying out the capillary analysis, the following technique is employed. The dye is dissolved in water and the appropriate concentration of reagent added. The optimum concentration of dye is of the order of 0.1 millimolar. If a colored food or drug product is being examined, the dye must first be removed from the product by the standard method of double dyeing on wool (9). It is then stripped with dilute ammonia solution, the liquid evaporated to dryness, and the residue made up to a concentration of about 0.1 millimolar. About five to ten cc. of the dye solution is then placed in the beaker in the apparatus, and a capillary strip is suspended from the cross bar and passed through the paraffin slit so that it hangs slightly above the surface of the solution. In the apparatus described, thirteen determinations can be started and run simultaneously. As soon as all of the strips are in place over the solutions, the glass plates are clamped on and a current of air allowed to pass through for a few minutes until the relative humidity falls to 55%. The cross bar is then lowered so that all the strips are simultaneously immersed in their respective solutions to a depth of 1 cm. A scale is provided for this purpose within the case. The humidity will tend to rise as capillary action begins. The air flow is therefore correspondingly regulated to maintain a 60% relative humidity for a period of thirty minutes. The air flow is then shut off and the strips removed and allowed to dry. Figure 2 shows the appearance of the thirteen dyes under the influence of one reagent. The strips are of course definitely colored and offer a much better contrast than is apparent in a black and white print. The amount of dye deposited on each strip is of the order of 0.1 to 1 gamma.

The following tables, abridged from several hundred experiments, show the capillary rise of the thirteen dyes as affected by the different reagents.

Capillary heights are expressed as centimeters of rise above the liquid surface; *viz.*, in the case of erythrosine in the presence of $AlCl_3$, the height of zero means no rise above the surface of the dye solution, although the strip may be colored at the lowest centimeter where it was immersed in the solution. It must be emphasized that the relative heights of dyes in any one series are of greater importance than the individual heights in centimeters. The latter will vary somewhat in different apparatus. Small variations in time, temperature and humidity will likewise have a slight effect upon the heights.

[1] Since this paper was written, the Department of Agriculture has added one more soluble food dye, the potassium salt of naphthol yellow S. Under the new act these dyes are designated as F. D. & C. dyes.

TABLE I.—EFFECT OF AQUEOUS SALT SOLUTIONS UPON CAPILLARY RISE.

Certified Dye.	Mol. Wt.	Color on Paper.	NaCl			Na_2SO_4	$BaCl_2$		$AlCl_3$		N. F. Soln. Al Acetate.
			M/1	*M*/10	*M*/100	*M*/10	*M*/10	*M*/100	*M*/10	*M*/100	*M*/4
Erythrosine	880	Brilliant Pink	1	1.5	5	1	1	2	0	0	1
Amaranth	604	Purplish Red	3.5	5.5	10.5	4	3.5	7	2.5	6.5	4.5
Ponceau 3R	494	Red	1.5	3.5	8.5	2	0	0	2.5	2.5	2.5
Ponceau SX	480	Red	4	6	10	4.5	3	5.5	2	3.5	3
Fast Green FCF	809	Green	9	12.5	13.5	12.5	7	10	5	7	8
Guinea Green B	691	Green	2	6	8.5	5	1.5	3	1.5	2	2
Light Green SFY	793	Pale Green	8.5	12	12.5	11.5	7.5	12.5	2.5	6	5
Indigotine	466	Violet Blue	2	5.5	9	3	2	5.5	2.5	6.5	4
Brilliant Blue FCF	793	Blue	6.5	11	13	9	5.5	7.5	4	5	6.5
Naphthol Yellow S	358	Yellow	6	9	11.5	6	7.5	10	4.5	8	7.5
Tartrazine	534	Yellow	5.5	8.5	12	7	7.5	10	4.5	9	8
Sunset Yellow FCF	452	Orange	4	7.5	10.5	4.5	6	9	3	6.5	7.5
Orange I	350	Orange	2.5	4	6	2.5	2.5	2.5	2	2.5	2

TABLE II.—EFFECT OF p_H UPON CAPILLARY RISE.

Certified Dye.	Hydrochloric Acid.					CH_3COOH	Dist. H_2O	NH_4OH	Sodium Hydroxide.	
	M/1	*M*/10	*M*/100	*M*/1000	*M*/10,000	*M*/100		*M*/100	*M*/1000	*M*/100
	p_H: 0.1	1	2	3	4	3.4	6	10.8	11.1	12.1
Erythrosine	0	0	0	5	11.5	7	11.5	12.5	7.5	10
Amaranth	3.5	5.5	5	13.5	13.5	15	14	14	13	14
Ponceau 3R	2	3.5	4.5	11	13	11.5	12.5	13.5	11.5	12.5
Ponceau SX	2.5	5	5	11.5	12.5	13	12.5	12.5	12	12.5
Fast Green FCF	11.5	9.5	10.5	14.5	14	16	14.5	13.5	13	13.5
Guinea Green B	11	6.5	3.5	6	12.5	4	11.5	12	11.5	12
Light Green SFY	13	13.5	13	12.5	12	15	12.5	12	11.5	11.5
Indigotine	3.5	5	5	11.5	13	13	13	13.5	12.5	12.5
Brilliant Blue FCF	10.5	8.5	9	13.5	13	15	13.5	13	12	12.5
Naphthol Yellow S	10.5	10	11	13	13	14	14	13	12.5	13
Tartrazine	7.5	9	11.5	13	13	15	13	13	12	12.5
Sunset Yellow FCF	5	7	9.5	12	12	14	12	12.5	12	12
Orange I	2	3.5	3	6.5	10	5.5	10	12	9.5	11

By running a control simultaneously with the unknown dye, identification will be facilitated. Such a control may consist of a single dye of the color of the unknown, or preferably a mixture of three dyes. A good combination is naphthol yellow, indigo and erythrosine, each in 0.1 millimolar concentration. After capillarization, the dyed strip will appear as a three-color zone pattern, yellow at the top, green in the middle and reddish at the bottom. Although there is an overlapping of colors at the bottom two-thirds of the color zone, the height of each of the three dyes can be sharply defined, and serves to gage the relative height of any certified dye that may be present in the unknown, and which has been capillarized from a separate beaker at the same time, and within the same apparatus.

The identification of a dye by this method is more often an indication rather than a positive proof of identity. However, while it is possible that two dyes may rise to the same height under the influence of a specific reagent, an examination of the tables will show that no two dyes behave the same for all reagents. It is of course not necessary to run a large series of experiments utilizing every reagent listed in order to identify the dye. The following represents a selection of reagents which will give the optimum differentiation:

For Red Dyes: Solution Aluminum Acetate, N. F. (Approximately $M/4$ or 5% aluminum acetate).
A better differentiation of ponceau 3R and SX is obtained by the use of $M/10$ NaCl.

For Yellow and Orange Dyes: $M/10$ Na_2SO_4. A better differentiation of naphthol yellow S and tartrazine is obtained with $M/1$ HCl.

For Blue and Green Dyes: $M/10$ Na_2SO_4.

An examination of the tables will show the following additional points of interest. Increase of salt concentration lowers the capillary rise. Increase of ion valence lowers the capillary rise. Between p_H 4 and 10, there is only a slight change in the capillary rise. However, exceptions exist for acetic acid and for ammonia. The greater volatility of these reagents, as compared with the other acids and bases, plays a rôle in modifying the rise of some of the dyes.

In addition to the reagents listed, reducing and oxidizing agents, such as sodium hydrosulfite and sodium persulfate were tried but gave little satisfaction. In general the blue and green dyes of the triphenylmethane class resisted bleaching action by these reagents. Likewise no advantages could be found in using the surface-active agents, such as sodium lauryl sulfate. These caused distortion or a general leveling of the capillary rises. An attempt to adapt filter paper strips previously impregnated with electrolytes, as applied by Clarke and Hermance (21) in their inorganic spot-testing technique, gave distorted images when applied to the capillary analysis of the dyes.

As a confirmatory test, the dyed strip may be examined and compared with a known dye by reflected light in a spectrophotometer. Investigations are at present under way to determine absorption maxima for the certified dyes at different concentrations, since no such data on spectral reflection curves are at present available in the literature. The spectral transmission properties of seven of the permitted dyes have been published (22) and curves for the other permitted dyes are at present being prepared by Evenson of the Color Certification Section of the Department of Agriculture. A more positive spectrophotometric identification can be made by the method of absorption ratios (23). This is the ratio of extinction coefficients of the dye solution at two specific wave-lengths at both sides of the maximum. Whether this method can be adapted to reflection measurements of dyed paper is at present being investigated.

When a mixture of several dyes is present, the problem becomes more complex. As can be visualized from an examination of Fig. 2, the presence of more than one dye in solution will give a blend of colors corresponding to the respective dyes.

It was reasoned however that if the differentiated capillary heights could be maintained, and the lower colored part of each strip could by some manner be eliminated, then a mixture of two dyes could be determined without interference. This was finally accomplished by the development of a method of successive capillarizations. That is, after the first thirty minute capillarization is completed, the colored strip is allowed to dry and again capillarized, under similar conditions of humidity, temperature and time, by immersion into a beaker containing a solution of appropriate reagents without any dissolved dye.

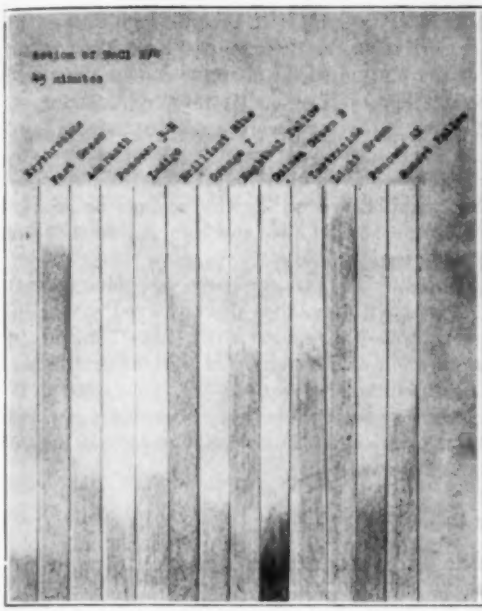

Fig. 2.

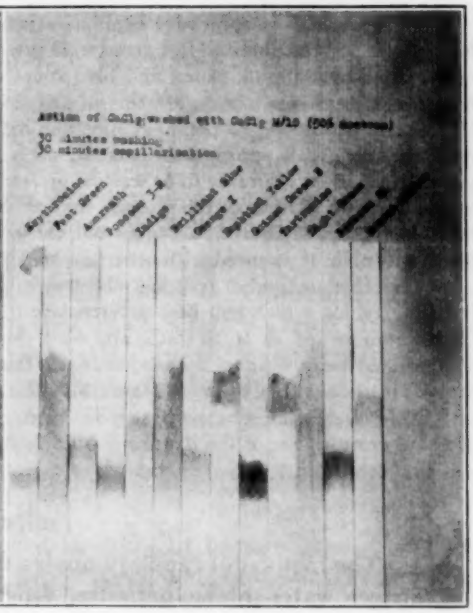

Fig. 3.

The reagent which thus far has been found to give the most successful results consists of $M/10$ $CaCl_2$ in 50% acetone. This second capillary procedure will be referred to as a washing process since the dye on the lower part of the strip is washed up by the capillary action of the colorless reagent. The dye forms a concentrated zone of color of relatively small vertical width. Figure 3 shows the result of a preliminary capillarization from solutions containing their respective dyes and $M/10$ $CaCl_2$, followed by a washing or second capillarization with a colorless solution of $M/10$ $CaCl_2$ in 50% acetone. It can readily be visualized by an inspection of the dyed strips that if several dyes were present, such as ponceau 3R and sunset yellow, or a mixture of naphthol yellow S, indigotine and erythrosine, that discrete bands of color would appear on the strip after the washing process, each at a different level from the others. Their identities can be confirmed by spectrophotometric examination.

The $CaCl_2$-acetone reagent was selected because it obviates certain difficulties which occur if other washing media are used. If water alone is used the heights of the final narrow zones are not sufficiently differentiated. However for mixtures of certain dyes this may prove effective. If an electrolyte such as Na_2SO_4 is used as the washing medium the dyes tend to become mordanted to the strip and are not washed up. If acetone and Na_2SO_4 are used, then the dye is released from the paper and is washed slowly upward. The only disadvantage of this combination is that the sodium sulfate tends to crystallize out on the upper part of the paper, due to the poor solvent action of the acetone, and an uneven or distorted color band is produced, obscuring the identification of the dye. However, by using a deliquescent electrolyte such as $CaCl_2$ in 50% acetone, no crystallization of salt occurs on the strip, and fairly even bands of color are obtained for the majority of the dyes.

Although as many as five dyes in admixture have been determined by this method, no attempt has been made to work out all possible combinations in which two to thirteen dyes might be present. There would be no point in attempting to separate a mixture of all thirteen dyes, since it is realized that dyes other than the certified ones might be present. There is not enough space on a capillary strip to permit clear-cut zones of all possible dyes that might be present. Even with a fewer number of dyes it is realized that there might be interferences. For example the blue dyes are difficult to wash up and tend to interfere in many cases with the separation of other dyes. It may be that other reagents than the one suggested will act as better washing agents.

The method of successive capillarizations is however subject to broader application. If for example, erythrosine and fast green were present in a mixture, the second capillarization would result in an overlapping of red and blue zones at the bottom of the strip, as can be visualized from an inspection of the two strips at the extreme left of Fig. 3. However, by cutting off the bottom centimeter of the color zone and attaching it to a new white capillary strip, a third capillarization with appropriate reagent, such as 50% acetone in water, without electrolyte, would cause the erythrosine to be washed up from the green dye which would be left in a pure state at the bottom. Although this process may at first sound somewhat lengthy, it must be remembered that each capillarization takes but thirty minutes, so that the total time involved is still far shorter than is required with other methods now in use.

Another method of treating mixtures is to select for the first capillarization some reagent from the tables, which will best differentiate the suspected dyes, then dry the dyed strips, dip them for an instant in $M/10$ $CaCl_2$ and wash them up with $CaCl_2$-acetone reagent. The method is at present being studied with reference to the detection of non-permitted dyes present as impurities in the certified dyes; *viz.*, martius yellow in naphthol yellow S.

Although some inferences may be drawn concerning correlation between capillary rise and chemical constitution of the dyes, particularly the number of SO_3Na groups present, conclusions will be deferred until a greater number of dyes have been studied.

SUMMARY.

1. The method of capillary analysis has been adapted to the identification of the thirteen water-soluble permitted food dyes when present individually.

2. A method of multiple capillarizations has been evolved to aid in the separation and identification of mixtures of these dyes.

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METHOD OF ANALYSIS FOR SULFANILAMIDE.*

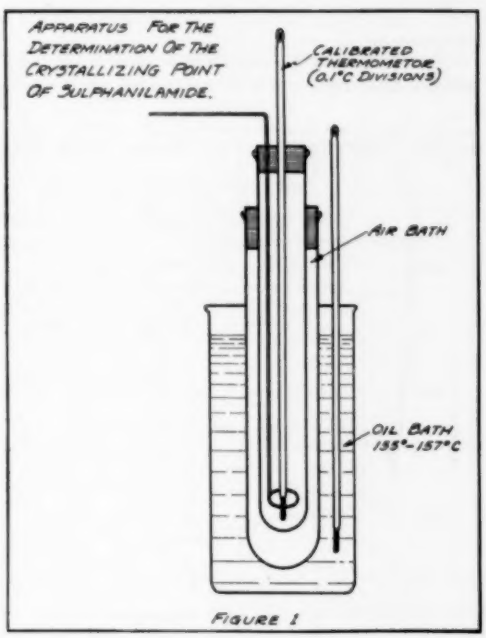
BY R. W. TOWNE AND R. M. HITCHENS.[1]

Coincident with the rapid growth of sulfanilamide therapy, many methods for the analysis of this compound have arisen. Numerous of these pertain to detection and estimation in blood, spinal fluid and the like. In addition, there is need for simple, accurate methods of estimating the purity of the sulfanilamide itself as marketed. "New and Non-Official Remedies" (1) offers several such means. Their melting-point determination is a rapid and reasonably accurate criterion of purity. Likewise, their microanalysis for sulfur allows an estimation of purity with a permissible limit of 98.4 to 101.6 per cent which is rather a wide range for an official assay procedure. More nearly quantitative is their volumetric diazotization assay with sodium nitrite, although this method suffers from the slowness of the reaction and the smallness of the sample. It has an allowable limit of 99.0 to 100.5 per cent. Unfortunately these last two methods are microchemical in nature and require special laboratory facilities and technique not available in much of the trade.

Shulek and Boldizar (2) have developed an assay by bromination which gives results within 0.5 per cent, tending to be high. Work done in this laboratory indicates that the results may be as much as 5 per cent high if room temperature is construed to be 25° C.

The methods used in this laboratory for the assay of sulfanilamide are in nature simple and rapid. They involve the physical method of crystallizing-point determination, plotting a time-temperature curve, which is sensitive to 0.1 mol. per cent impurity, and the "New and Non-Official Remedies" diazotization procedure, performed potentiometrically using a platinum electrode on a macro sample in the presence of potassium bromide as a catalyst, and accurate to 0.1 per cent. The potentiometer may be replaced by starch-iodide indicator with little, if any, loss in accuracy.

The two methods are outlined in detail below:


APPARATUS FOR THE DETERMINATION OF THE CRYSTALLIZING POINT OF SULPHANILAMIDE.
CALIBRATED THERMOMETOR (0.1°C DIVISIONS)
AIR BATH
OIL BATH 135°-157°C
FIGURE 1

METHOD I. DETERMINATION OF CRYSTALLIZING POINT.

The apparatus for crystallizing point determinations (Fig. 1) consists of a test-tube with stirrer, a slightly larger tube for an air jacket, a vessel for an oil bath, and a precision calibrated thermometer graduated in 0.1° divisions.

* Presented before the Scientific Section, A. PH. A., Atlanta meeting, 1939.

[1] Analytical Laboratory, Monsanto Chemical Co., St. Louis, Mo.

Sufficient sample is placed in the inner tube to produce a 3-inch layer of molten sulfanilamide. The tube is then fitted with a glass ring stirrer and the precision thermometer and suspended in an air jacket within an oil-bath maintained at 157–160° C. The contents of the tube are stirred slowly as the temperature falls. The temperature is noted each minute until the crystallizing plateau has been reached and passed.

NOTE: The temperature must not be permitted to rise above 175° C. when melting the sample. After solidification the contents of the tube are remelted and the determination repeated.

METHOD II. ASSAY BY POTENTIOMETRIC DIAZOTIZATION.

Reagents: (1) Hydrochloric acid, A. R. (2) 0.5*N* sodium nitrite solution, standardized against pure anthranilic acid and pure sulfanilic acid. (3) Potassium bromide, A. R.

PROCEDURE.

Place 3.4 Gm. of the sample, accurately weighed, in a 250-cc. beaker; add 20 cc. of concentrated hydrochloric acid and 80 cc. of water. Cool to 0–5° C. Add a few crystals of potassium bromide and about 20 cc. of chipped ice. Place the beaker in an ice-bath. Insert this mixture under a mechanical stirrer and the electrode system, bright platinum-solution-0.1*N* KCl-AgCl-Ag. Place the burette tip beneath the surface of the solution and add about 38 cc. of 0.5*N* sodium nitrite solution taking approximately two minutes for the addition. From this point read the potential after each 0.05 cc. addition of reagent. Calculate the difference in potential for each addition. The largest change in potential occurs at the end-point. This end-point occurs at about 425–525 mv.

Calculation:

$$\text{Per cent sulfanilamide} = \frac{\text{cc.}\,0.5N\,NaNO_2 \times 0.0860 \times 100}{\text{Weight of sample}}$$

NOTE: When approaching the end-point, wait a few seconds before adding each increment of reagent as the potential is slow to reach a steady value. This difficulty disappears at once after the end-point is reached.

VERIFICATION OF PROPOSED METHODS.

Pure sulfanilamide was prepared by recrystallizing a commercial sample from 50 per cent alcohol and from water in succession, pulverizing and drying *in vacuo*. The purity was checked by taking the crystallizing point after each crystallization and as there was no increase, the material was assumed to be pure.

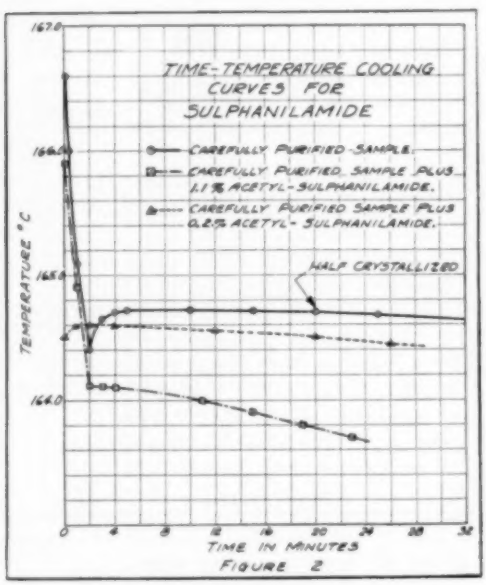


FIGURE 2

This was verified by careful crystallization point determinations, the time-temperature curve for one of which is shown in Fig. 2. The extreme flatness of this curve during crystallization is ample evidence that this material is pure. Within the limits of error of reading the thermometer, there is no drop in crystallizing point during solidification of over half the sample.

The sensitiveness of the crystallizing point method to the presence of small amounts of impurities was checked by adding to the sample varying amounts of acetyl sulfanilamide, a likely impurity in commercial sulfanilamide, and making new time-temperature curves. Figure 2 shows clearly that the addition of 0.2 mol per cent acetyl sulfanilamide not only lowers the crystallizing point 0.1° C., but also produces a time-temperature curve with a distinct downward slope. The

addition of a larger amount, 1.2 mol per cent, produces the same effect to a proportionately greater degree. Evidently the crystallizing point determination is sensitive to 0.1 mol per cent of impurities soluble in sulfanilamide. The same pure sample assayed by Method II was found to have a purity of 100.0 per cent. The abruptness of the change in potential at the end-point is readily seen in Fig. 3. The differential curve, in which changes in potential per cc. of reagent are the ordinates, brings this out even more forcibly (Fig. 4).

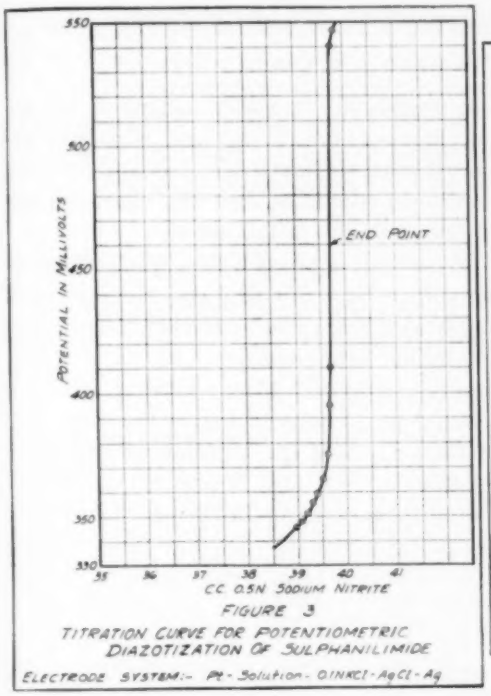


FIGURE 3

TITRATION CURVE FOR POTENTIOMETRIC DIAZOTIZATION OF SULPHANILIMIDE

ELECTRODE SYSTEM:- Pt - Solution - 0.1N KCl - AgCl - Ag

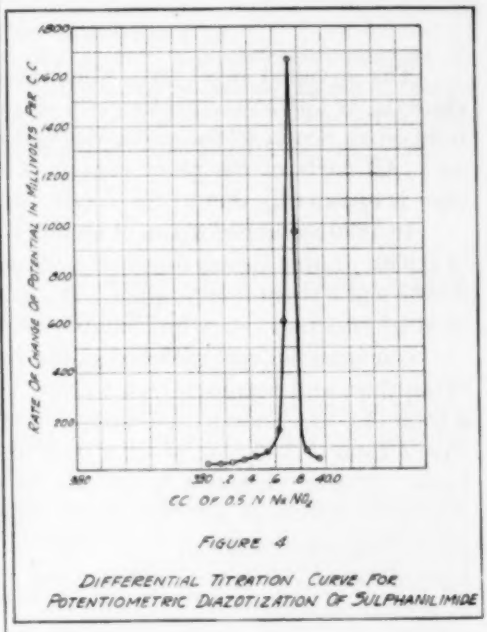


FIGURE 4

DIFFERENTIAL TITRATION CURVE FOR POTENTIOMETRIC DIAZOTIZATION OF SULPHANILIMIDE

Several commercial samples of sulfanilamide were analyzed by the two methods, the results being shown in Table I.

TABLE I.—ANALYSIS OF COMMERCIAL SULFANILAMIDES.

Sample.	Crystallizing Point, ° C.	Assay by Potentiometric Diazotization, ° C.
1*	164.7	100.0
2	164.7	100.0
3	164.5	99.9
4	164.6	100.0
5	164.7	100.0
6	164.6	99.9
7	164.3	99.7
8	164.6	99.9

* Pure sulfanilamide.

CONCLUSIONS.

The two methods described for the assay of sulfanilamide are both rapid and accurate. The crystallizing point method will detect as little as 0.1 mol per cent of soluble impurities including isomers and other amino compounds. The diazotization titration is likewise accurate to 0.1 per cent. The two methods combined are a precise method for estimating the purity of sulfanilamide.

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THE VOLATILE OIL OF COMPTONIA ASPLENIFOLIA.*

BY ROMULUS DE NICOLA AND E. V. LYNN.[1]

The so-called sweet fern, which grows prolifically in many regions of Massachusetts, is *Comptonia asplenifolia, Aiton* (*Myricaceæ*). It is found in sterile soil from Nova Scotia to Saskatchewan and southward to North Carolina and Tennessee. All parts of the plant contain a resinous substance, but the characteristic odor is apparently due to the volatile oil found chiefly in the leaves.

In 1890 Schimmel & Co. obtained[2] 0.08 per cent of an oil with a specific gravity of 0.926. Later Braun distilled[3] 0.02 per cent of an oil with a specific gravity of 0.8945 and a slight levorotation. He fractionated the oil and reported the presence of aldehydes and esters but identified no specific compounds.

Our material was gathered in the summer of 1938 in Massachusetts and New Hampshire and was identified by Dr. Youngken. Upon drying in the air it lost a total of 63.14 per cent. Distillation of 130 pounds of the fresh leaves and stems gave a total of 31.5 Gm. of oil, a yield of 0.054 per cent, or 0.14 per cent on the dry basis. It was yellowish brown in color, with a cinnamon-like odor, a specific gravity of 0.9154 at 20°/20° C., an index of refraction of 1.4870 at 20° C. and a congealing point of about 5° C. The acid value was 14.04, ester value 13.30, and saponification value after acetylization 58.66. The color prevented determination of optical rotation.

The acids, extracted by sodium carbonate, were distilled and titrated (Du Claux method) to give values of 6.6, 6.6 and 7.5. Theoretical for formic, acetic and propionic are 4, 7 and 12, respectively. From the acid mixture could be extracted by ether a small amount of substance which was precipitated with silver nitrate. The ignited precipitates left residues of 43.21 and 33.70 per cent of silver, indicating acids with molecular weights of 142.9 and 213.4, respectively.

The phenolic fraction, extracted by alkali, amounted to 0.24 per cent. From it no bromide or phenylurethane could be obtained, and other reactions indicated that the substance consisted chiefly of lactone.

The original oil gave no reaction with Schiff's reagent or with semicarbazide hydrochloride which would indicate that the oil contains no aldehydes nor ketones.

Distillation at 18 mm. pressure yielded 20 per cent below 70° C., probably terpenes. No crystalline nitrosochloride could be obtained, although the mixture was cooled greatly.

The fraction between 70° and 150° C. amounted to 35 per cent. It was found to contain cineol by converting to the iodol compound melting at 110° C. Borneol could not be identified.

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* Presented before the Scientific Section, A. PH. A., Atlanta meeting, 1939.

[1] Massachusetts College of Pharmacy, Boston, Mass.

[2] Report October, 1890, page 61.

[3] JOUR. A. PH. A., 15, 336–337 (1926).

The oil boiling above 150° C. constituted about half of the total. The presence of caryophyllene was indicated by odor and physical constants, but we were unable to isolate any derivatives. The characteristic odor of the oil seems to reside in this upper fraction.

SUMMARY.

1. The fresh leaves gave 0.05 per cent of yellowish brown oil whose constants are recorded.

2. The oil contains about 20 per cent of terpenes, a considerable amount of cineol and smaller quantities of esters and alcohols, but no aldehydes nor ketones. Acetic acid and small amounts of unidentified acids and lactones are also present.

3. The chief constituents are high boiling and may include caryophyllene.

A COMPARATIVE STUDY OF THE THREE RECOGNIZED ASSAYS FOR OIL OF CHENOPODIUM.*

BY WILLIAM F. REINDOLLAR.[1]

Chenopodium or American Wormseed Oil has long been employed as an anthelmintic against round worms in man and stock animals, and more recently has come into use as an agent in the treatment of hookworm.

The principal constituents of the oil are ascaridole, an organic peroxide occurring to the extent of 60–80 per cent, and a hydrocarbon fraction containing cymene, limonene, sylvestrene, phellandrene, etc. Of these components it has been shown that ascaridole alone exhibits anthelmintic action (1), hence should be used as the basis for evaluating the oil. As ascaridole readily reverts to an inactive form, ascaridole glycol anhydride when distilled with steam, as in its removal from the plant, it is highly desirable to employ a method which distinguishes between these two substances.

Assay processes for wormseed oil are given in the Official and Tentative Methods of the Association of Official Agricultural Chemists (2), and in the British (3) and United States Pharmacopœias (4). The first two procedures determine ascaridole, while the last named measures the acetic-acid soluble fraction of the oil. The A. O. A. C. method is a modification of one first proposed by Humphrey Paget (5), and which involves the reduction of ascaridole by titanous chloride; the British Pharmacopœia has adopted the Cocking and Hymas (6) procedure based on the liberation of iodine from potassium iodide by the organic peroxide ascaridole; while the U. S. P. employs the Nelson (7) method which depends on the differential solubility of the organic peroxide and hydrocarbon fractions in 60 per cent acetic acid.

Although Broughton and Weiland (8) have demonstrated the merits and limitations of the A. O. A. C. procedure and pointed out its superiority over the method official in the U. S. P. X (9), it was not adopted by either the British or

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* Presented before the Scientific Section, A. PH. A., Atlanta meeting, 1939.

[1] From the Laboratories of the Bureau of Chemistry of the State of Maryland Department of Health.

American Pharmacopœias in their recent revisions. Investigators are not in agreement concerning the British method. Broughton (10) felt that, in spite of the number of factors which influence its accuracy, the method was worthy of further study, Dafert and Capesius (11) found it simple and accurate, while Bodendorff (12) stated that the development of an exact quantitative method for ascaridole based upon iodometric procedure is highly improbable.

In view of the fact that three recognized procedures exist for evaluating wormseed oil, and that two of them are employed to determine the legality of the product in certain areas where it is sold, it would seem highly desirable that the three assays yield consistent results when applied to the same oil. In order to learn how good an agreement might be obtained under such circumstances, this investigation was undertaken.

EXPERIMENTAL.

Reagents.—Pure crystallized ferrous ammonium sulfate, whose iron content had been determined, was employed as a primary standard in preparing the volumetric ferric iron solution and in standardizing the titanous chloride solution. Freshly prepared 0.1 *N* sodium thiosulfate, standardized by titration against standard dichromate solution, served as the basic volumetric reagent in the British Pharmacopœial assay. Other reagents were prepared from C.P. chemicals as described in the three procedures.

Samples.—Ten samples of wormseed oil were selected for examination. These oils varied in age from eight years to about six months. Five samples were the so-called normal oils, the other five were produced by redistillation of the condensed steam employed in the distillation of the normal product and are termed by the producers "high test" oils. Their ascaridole content usually falls between 85 and 99 per cent. All of these samples were authentic, having been collected from the stills at the time of production.

Procedure.—The procedures were carried out as described in the three aforementioned texts, little or no difficulty being encountered. By employing a salt-ice mixture the temperature of −3° C. required for reaction in the British Pharmacopœial method is readily reached and maintained. Five blanks run on the reagents at different times during this assay varied from 0.35 cc. to 0.62 cc. with an average of 0.46 cc. 0.1 *N* sodium thiosulfate. This variation is one of the weak points of the British method. In the U. S. P. procedure a period of one-half hour was permitted to elapse for the separation of the oily and aqueous layers. The A. O. A. C. method presents no difficulties once the unstable titanous chloride solution has been standardized and properly preserved from access of air. The results obtained by each method together with specific gravity and solubility data are presented in Table I.

TABLE I.

Lab. No.	Date of Distillation	Type of Oil	Specific Gravity	Solubility 70% Alcohol	A. O. A. C	B. P.	U. S. P.
1-996	1931	Hi Test	...	1.5	88.8	88.8	97.5
1-997	1931	Normal	0.99[1]	2.0	73.9	73.4	69.4
3-1417	1933	Normal	0.990	2.0	73.4	75.7	70.9
3-1430	1933	Hi Test	1.007	1.5	93.9	90.0	100.0
5-1264	1935	Hi Test	1.007	1.5	93.6	91.9	100.0
5-1267	1935	Normal	0.978	2.0	66.8	68.2	55.1
8-1213	1938	Hi Test	1.002	1.5	90.7	88.8	100.0
8-1214	1938	Normal	0.989	1.5	77.0	77.4	67.1
8-1216	1938	Normal	0.990	2.0	78.3	79.8	71.6
8-1217	1938	Hi Test	1.007	1.5	97.1	93.0	100.0

An inspection of these data show that results obtained by either the A. O. A. C. or B. P. method are fairly concordant and that each differs considerably from those obtained by the U. S. P. process. Values obtained by this last-named assay are higher than the other two in the high per-

centage range and distinctly lower in the normal percentage range. It, therefore, becomes necessary in reporting wormseed oil data to specify the analytical procedure employed.

A comparison of the analyses of these oils, made just after distillation, with the recently prepared data reveals some interesting facts. Apparently specific gravity and alcohol solubility increase with age while there is a distinct loss in ascaridole when determined by the A. O. A. C. method. Although aging modifies these three factors the correlation existing among them (13) remains unaffected. The values obtained in the original and recent analyses are presented in Table II.

TABLE II.

Lab. No.	Date of Distillation.	Type of Oil.	Specific Gravity. Early.	Specific Gravity. Recent.	Solubility 70% Alcohol. Early.	Solubility 70% Alcohol. Recent.	Ascaridole (A. O. A. C.). Early.	Ascaridole (A. O. A. C.). Recent.
1-996	1931	Hi Test	1.001	...	1.5	1.5	98.8	88.8
1-997	1931	Normal	0.966	0.991	4.0	1.5	84.3	73.9
3-1417	1933	Normal	0.966	0.990	5.0	2.0	79.6	73.4
3-1430	1933	Hi Test	1.001	1.007	2.0	1.5	97.5	93.9
5-1264	1935	Hi Test	0.999	1.007	2.0	1.5	98.4	93.6
5-1267	1935	Normal	0.951	0.978	6.0	2.0	69.9	66.8
8-1213	1938	Hi Test	0.993	1.002	1.5	1.5	95.6	90.7
8-1214	1938	Normal	0.958	0.989	5.5	1.5	81.3	77.0
8-1216	1938	Normal	0.959	0.990	5.5	2.0	82.9	78.3
8-1217	1938	Hi Test	0.994	1.007	1.5	1.5	98.5	97.1

SUMMARY.

A comparative study of the A. O. A. C., B. P. and U. S. P. assays for wormseed oil made upon authentic samples shows that the two former methods yield results concordant with each other but at variance with those obtained by the U. S. P. procedure.

Although aging of wormseed oil results in an increase in density and alcohol-solubility and a decrease in ascaridole, the general relationship existing among these factors remains unchanged.

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(5) Paget, H., *Analyst*, 51, 170 (1926).
(6) Cocking, T. T., and Hymas, F. C., *Ibid.*, 55, 180 (1930).
(7) Nelson, E. K., JOUR. A. PH. A., 10, 836 (1921).
(8) Broughton, L. B., and Weiland, J. S., *J. A. O. A. C.*, 13, 334 (1930).
(9) *United States Pharmacopœia* X, page 255 (1926).
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On September 15, 1939, the Winthrop Chemical Company, Inc., opened a new Professional Service Office in Baltimore, Maryland, Suite 1626, Baltimore Trust Building. This office will be in charge of Mr. E. E. Dungan.

Druggists, physicians, dentists and hospitals located in Maryland, Delaware, Virginia, the District of Columbia, and sections of New Jersey, Pennsylvania and North Carolina, are cordially invited to avail themselves of the facilities of this office. All information concerning the scientific and clinical phases of Winthrop products is obtainable at the Baltimore office within a minimum interval of time.

THE HEAVY METALS TEST OF THE U. S. P.*

BY M. W. CAREY AND R. E. SCHOETZOW.[1]

The United States Pharmacopœia makes no distinction between inorganic substances and organic ones, with the exception of the volatile oils, in testing for heavy metal impurities. It is known that in many organic compounds the heavy metal impurities may be so firmly combined chemically with organic matter that the sensitivity of the test with hydrogen sulfide is impaired. The possibility is also recognized that the organic matter, even if not in chemical combination with the metal, may be of such a nature as to inhibit the formation of visible sulfides.

We find the following instances where traces of heavy metals present have not been detected by the U. S. P. XI heavy metal test, but have been detected by first destroying the organic matter by digestion with sulfuric and nitric acids and then applying the U. S. P. XI test:

Sample	Organic Matter Destroyed. Acid Solution.	Organic Matter Destroyed. Alkaline Solution.	Organic Matter Not Destroyed. Acid Solution.	Organic Matter Not Destroyed. Alkaline Solution.
Calcium mandelate				
85658	Slight color	Green color	None found	Slight green color
85659	Slight color	Green color	None found	Slight green color
85660	Slight color	Green color	None found	Slight green color
86068	Slight color	Green color	None found	Slight green color
Acid dehydrocholic				
88308	Faint color	Green color	None found	Slight green color
90056	Faint color	Dark green color	None found	Slight green color
90058	Faint color	Dark green color	None found	Slight green color
90059	Faint color	Dark green color	None found	Slight green color
Sulfanilamide				
87205	Slight color	None found	None found	Slight green color
87207	Slight color	None found	None found	Slight green color
Calcium gluconate				
87373	Slight color	Slight green color	None found	None found
Yeast				
87288	Slight color	Dark green color	None found	Faint color
Acid Mandelic				
87285	Faint color	Slight color	None found	Faint color
Triisopropanolamine				
86948	Definite color	None found	None found	None found

From the above it seems obvious that if one desires to know whether there are any traces of heavy metals present in organic compounds or samples containing organic material it is necessary to first destroy the organic matter. But, since the destruction of organic matter presents difficulties such as liberation of disagreeable fumes, consumption of time and, more important, the possibility that metals may

* Presented before the Scientific Section, A. PH. A., Atlanta meeting, 1939.

[1] Analytical Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb & Sons, Brooklyn, N. Y.

be lost during the ashing or the destruction of the organic material by other means, we urge that the question be studied, especially as to how best to destroy the organic material, if it is desired that organic medicinals be as free from metallic contamination as the inorganic medicinals, and that the prior destruction of organic materials be made a part of the U. S. P. heavy metals test. Further we suggest that, if it should be found difficult to prevent the presence of some traces of metallic impurities in organic medicinals, it would be advisable to further amplify the U. S. P. tests to show the identity of the metal present and indicate the amount permissible. A toxic metal such as mercury or lead should be strictly limited in concentration, while more leniency might be shown to less toxic or harmless ones.

DRUG EXTRACTION. XXII. THE EXTRACTION OF PODOPHYLLUM.*,[1]

BY WILLIAM J. HUSA[2] AND D. W. LEE.[3]

In a previous study (1) it was found that alcohol was preferable to alcohol-water mixture (9:1) for the preparation of resin of podophyllum. Further research has been carried out to determine the relative efficiency of various methods of extraction as applied to podophyllum.

EXPERIMENTAL PART.

Materials Used.—Podophyllum, U. S. P. in fine powder (No. 60) obtained from two different sources was used. Drug A contained 7.35% resin and 7.24% moisture. Drug B contained 5.69% resin and 7.66% moisture. Alcohol was used as the menstruum.

Analytical Methods.—Resin determinations were made by the U. S. P. XI method. Moisture was determined by the U. S. P. XI method for drugs containing no constituents volatile at 100° C. To determine total extractive, 10 cc. of liquid were evaporated to apparent dryness on a water-bath, the residue treated with 1 cc. of absolute alcohol and again evaporated to dryness on a water-bath; the residue was then heated in an oven at 105° C. until the loss in weight between two successive weighings did not exceed 5 mg. Due to the hygroscopic nature of the resin, the balances were equipped with balance desiccators.

Experiment 1. Maceration with an Excess of Alcohol.—An experiment was conducted to determine the time necessary for the establishment of equilibrium in the maceration of podophyllum with an excess of alcohol, using the centrifuge method developed by Husa and Magid (2).

Into each tared, wide-mouth bottle of about 250-cc. capacity were placed 10 Gm. of drug and 90 Gm. of alcohol. The bottles were then placed in a cabinet at 22–25° C. for 15 minutes, during which time the bottles were gently shaken every 5 minutes. The bottles were then centrifuged at about 1000 r. p. m. for ten minutes and allowed to stand 5 minutes. The clear supernatant liquid was decanted into tared, glass-stoppered bottles and weighed; the bottles containing the wet marc were also weighed. The macerate was adjusted to 20° C. before withdrawing samples for assay. The same technique was used for 12-hour, 24-hour and 36-hour maceration periods except that the bottles were shaken at convenient irregular intervals.

Calculations were made as follows: (Weight of drug) minus (weight of moisture in drug) minus (weight of total extractive in macerate) = (weight of dry marc). (Weight of wet marc) minus (weight of dry marc) = (weight of liquid imbibed by the marc). The loss of menstruum

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* Presented before the Scientific Section, A. PH. A., Atlanta meeting, 1939.

[1] This paper is based on a thesis presented to the Graduate Council of the University of Florida by D. W. Lee, in partial fulfilment of the requirements for the degree of Master of Science in Pharmacy.

[2] Head Professor of Pharmacy, University of Florida.

[3] Holder of a University of Florida Graduate Scholarship, 1938–1939.

during the process was determined by comparing the total weight of the materials used with the combined weight of the macerate and wet marc.

The results in Table I are averages of duplicate assays of single macerations; the results were duplicated in another experiment which is not reported in detail.

TABLE I.—MACERATION WITH AN EXCESS OF ALCOHOL.

Period of Maceration.	Weight in Gm. of— Liquid Imbibed in Marc.	Dry Marc.	Macerate.	Total Extractive.	Resin.
Drug A					
15 minutes	8.64	9.09	82.07	0.191	0.187
12 hours	8.65	8.92	82.41	0.358	0.312
24 hours	9.60	8.65	81.52	0.628	0.536
36 hours	9.76	8.65	81.57	0.628	0.548
Drug B					
15 minutes	7.60	9.06	83.21	0.173	0.173
12 hours	8.76	8.76	82.38	0.472	0.404
24 hours	7.84	8.69	83.25	0.549	0.431
36 hours	8.40	8.68	82.87	0.552	0.433

Assuming that the liquid imbibed in the marc contained the same concentration of dissolved resin as the macerate, calculations were made to determine the distribution of the resin at different stages of maceration. The results are given in Table II.

TABLE II.—DISTRIBUTION OF RESIN IN MACERATION WITH AN EXCESS OF ALCOHOL.

Period of Maceration.	Percentage of Resin.— In Liquid Imbibed in Marc.	In Macerate.	Left Undissolved in Marc.
Drug A			
15 minutes	2.7	25.3	72.0
12 hours	4.3	42.4	53.3
24 hours	9.0	72.9	18.1
36 hours	9.0	74.6	16.4
Drug B			
15 minutes	2.9	30.5	66.6
12 hours	7.6	71.0	21.4
24 hours	7.0	75.4	17.6
36 hours	7.1	76.1	16.8

Tests were carried out on Drug B to determine whether a higher proportion of resin would be extracted by using a longer maceration period and increasing the quantity of menstruum. The technique was the same as in the preceding experiments except that 90 Gm. of menstruum were used in two bottles and 135 Gm. of menstruum in two others; in all cases the time of maceration was one week. The results are given in Table III. The calculated distribution of resin is shown in Table IV.

TABLE III.—MACERATION WITH AN EXCESS OF ALCOHOL FOR ONE WEEK USING DRUG B.

	Weight in Gm. of— Liquid Imbibed in Marc.	Dry Marc.	Macerate.	Total Extractive.	Resin.
		Using 90 Gm. of Menstruum.			
	8.05	8.75	82.95	0.485	0.433
	8.15	8.75	82.81	0.487	0.429
Average	8.10	8.75	82.88	0.486	0.431
		Using 135 Gm. of Menstruum.			
	8.42	8.62	127.6	0.619	0.495
	8.20	8.63	127.9	0.609	0.463
Average	8.31	8.62	127.8	0.614	0.479

TABLE IV.—DISTRIBUTION OF RESIN AFTER MACERATION FOR ONE WEEK USING DRUG B.

	Percentage of Resin.		
	In Liquid Imbibed in Marc.	In Macerate.	Left Undissolved in Marc.
	Using 90 Gm. of Menstruum.		
	7.4	76.1	16.5
	7.4	75.4	17.2
Average	7.4	75.8	16.8
	Using 135 Gm. of Menstruum.		
	5.7	87.0	7.3
	5.2	81.4	13.4
Average	5.5	84.2	10.3

Experiment 2. Percolation.—A 250-gram portion of drug was packed in the dry state in a pyrex glass tube 64 cm. in length and 4 cm. in internal diameter. The drug was introduced into the percolator tube in small portions with slight agitation to promote even distribution and after all the drug had thus been introduced it was packed from the top, starting with light pressure which was gradually increased. The menstruum was added and when the liquid reached the lower orifice the flow was stopped for a maceration period of 12 hours. Percolation was then allowed to proceed; in each case the following successive portions of percolate were collected: 125 cc., 125 cc., 250 cc., 250 cc., 500 cc. The rate of flow was from 0.02 to 0.08 cc. per minute.

To determine the effect of tightness of packing, some tubes were packed lightly and some firmly. With light packing the volume of packed drug was 390 to 395 cc. and the length of the drug column was 290 to 295 mm.; with firm packing the volume of packed drug was 350 to 355 cc. and the length of the drug column was 260 to 265 mm. The time required for the liquid to reach the lower orifice was 455 to 480 minutes for the lightly packed drug and 968 to 1080 minutes for the firmly packed drug.

TABLE V.—PERCOLATION OF PODOPHYLLUM.

	Resin Extracted in Gm.					
	Drug A.			Drug B.		
Fraction.	Light Packing.	Firm Packing.	Firm Packing.	Light Packing.	Firm Packing.	Firm Packing.
I (125 cc.)	9.09	14.71	14.45	10.04	11.58	11.91
II (125 cc.)	5.41	1.87	1.32	2.60	1.13	0.93
III (250 cc.)	1.40	0.84	0.73	0.52	0.43	0.49
IV (250 cc.)	0.50	0.31	0.52	0.20	0.21	0.21
V (500 cc.)	0.44	0.49	0.38	0.22	0.22	0.28
Total (1250 cc.)	16.84	18.22	17.40	13.58	13.57	13.82
	Percentage of Resin Extracted.					
I (125 cc.)	49.5	80.0	78.6	70.1	81.4	83.7
II (125 cc.)	29.4	10.1	7.2	18.3	8.0	6.6
III (250 cc.)	7.6	4.5	3.9	3.7	3.0	3.5
IV (250 cc.)	2.7	1.7	2.8	1.4	1.5	1.5
V (500 cc.)	2.4	2.7	2.0	1.5	1.5	2.0
Total (1250 cc.)	91.6	99.0	94.5	95.0	95.4	97.3
	Total Extractive in Gm.					
I (125 cc.)	10.84	17.33	17.17	11.42	13.18	13.55
II (125 cc.)	6.47	2.82	2.07	3.41	1.91	1.62
III (250 cc.)	2.49	1.59	1.45	1.64	1.41	1.31
IV (250 cc.)	1.06	1.03	1.07	0.92	0.96	0.80
V (500 cc.)	1.65	1.74	1.47	1.13	1.00	1.06
Total (1250 cc.)	22.51	24.51	23.23	18.52	18.46	18.34

Experiment 3. Forced Percolation through a Long Column of Drug.—Using Drug B, tests were conducted to determine the efficiency of extraction of podophyllum by the method of forced percolation through a long column of drug. The apparatus previously described by Husa and Huyck (3) was employed. A long column of drug was obtained by using pyrex glass pipes joined together by means of U-shaped fittings made of pyrex glass pipe. The dimensions of the tubes were as follows: length, 91 cm.; internal diameter, 2.5 cm.; thickness of wall, 5 mm. Three percolations were conducted in order to have variations in the number of tubes and tightness of packing. The menstruum was forced through the drug with air pressure which was gradually increased from a slight pressure to a maximum of 30 lbs. per square inch. In experiments 3-*A* and 3-*B* as much drug as possible was placed loosely in each tube and then packed from the top; in experiment 3-*C* the drug was introduced in 20-Gm. portions with moderate packing after each addition. Before packing, the drug was moistened with 25 cc. of menstruum per 100 Gm. of drug.

During the extraction several breaks in the drug column were observed in 3-*A*, such as might be due to contraction of the drug on removal of extractive or to settling of the drug. In 3-*B* the breaks were numerous and extensive because the drug had been packed very lightly. In 3-*C* no breaks occurred in the drug column during percolation.

TABLE VI.—FORCED PERCOLATION THROUGH LONG COLUMN OF DRUG.

Experimental Data.

Experiment.	Number of Tubes.	Gm. of Drug Used.	Volume of Packed Drug in Cc.	Time in Hrs. for Menstruum to Reach Orifice.	Time of Collections of Fractions in Hours. Fraction I.	Fraction II.
3-*A*	8	3275	5640	440	316	..
3-*B*	6	1861	4230	130	34	33
3-*C*	6	2270	4230	136	82	74

	Fraction I.			Fraction II.		
	Volume in Cc.	Gm. Resin.	Gm. Total Extractive.	Volume in Cc.	Gm. Resin.	Gm. Total Extractive.
3-*A*	1637.5	166.5	193.6	..	..	..
3-*B*	930.5	89.5	102.6	930.5	6.5	21.1
3-*C*	1135.0	123.6	144.1	1135.0	4.2	12.5

Percentage of Resin Extracted.

Fraction.	Exp. 3-*A*.	Exp. 3-*B*.	Exp. 3-*C*.
I (0.5 cc. per 1 Gm. drug)	89.3	84.5	95.7
II (0.5 cc. per 1 Gm. drug)	..	6.1	3.3
Total (1 cc. per 1 Gm. drug)		90.6	99.0

DISCUSSION OF RESULTS.

Maceration with an Excess of Alcohol.—The data in Tables II and IV indicate that equilibrium is attained in 36 hours in macerating 10 Gm. of podophyllum with 90 Gm. of alcohol. It appears that 90 Gm. of alcohol are insufficient for complete extraction of 10 Gm. of podophyllum at room temperature; even with 135 Gm. of alcohol about ten per cent of the resin remained undissolved. In this respect podophyllum differs from belladonna root, since Husa and Magid (2) using belladonna root showed that as much of the alkaloid was extracted in 15 minutes as in 24 hours with Nos. 40, 60 and 80 powders, but not with No. 20 powder, which gave a maximum yield of alkaloids after one hour. In the case of jalap, Husa and Fehder (4) found that equilibrium in the extraction of resin was reached within 15 minutes.

Table I indicates that the material extracted from podophyllum during the first 15 minutes of maceration was practically all resin. It was also found that the

resin was not extracted at the same rate from two different samples of drug. The drug containing the lower percentage of resin was extracted more rapidly than the drug containing the higher percentage of resin. Possibly the percentage of resin is higher in older plants whose tissues may become less permeable with increasing age.

Extraction by Percolation.—The results in Table V indicate that when podophyllum was packed firmly a greater proportion of the resin was extracted in the first fraction of percolate than was the case with light packing. However, the quantity of resin extracted in 1250 cc. of percolate from 250 Gm. of drug was almost the same for both methods of packing. Using pyrex glass tubes 64 cm. long and 4 cm. in internal diameter, it was found that the first 125-cc. portion of percolate from 250 Gm. of drug contained most of the resin. The first 250 cc. of percolate from 250 Gm. of drug contained about 85 to 90 per cent of the total resin of the drug.

Forced Percolation through a Long Column of Drug.—Using the method of forced percolation through a long column of drug it was found that as much as 99 per cent of the resin could be extracted in the first 1000 cc. of percolate from 1000 Gm. of drug, compared with 85 to 90 per cent with a shorter drug column. Best results were obtained when the drug was packed in small successive portions with moderate firmness in such a manner that no breaks in the drug column occurred during percolation. Table VI shows that best results were obtained in 3-*C*, in which no breaks occurred in the drug column, next best results were observed in 3-*A* which showed some breaks, and poorest results were obtained in 3 *B*, which showed numerous breaks in the drug column. When breaks occur in the drug column the open spaces become partly filled with liquid and at these points there would doubtless be more diffusion and less efficient displacement of the more saturated liquid by less saturated liquid.

SUMMARY.

Podophyllum was extracted by various methods. In the process of maceration of podophyllum with an excess of alcohol, equilibrium was reached in 36 hours. By percolation in cylindrical pyrex glass tubes, the first 250 cc. of percolate from 250 Gm. of drug contained 85 to 90 per cent of the total resin of the drug. In a method of forcing the menstruum through a long column of drug by means of air pressure, as much as 99 per cent of the resin was obtained in the first 1000 cc. of percolate from 1000 Gm. of drug.

REFERENCES.

(1) Husa, W. J., and Fehder, P., JOUR. A. PH. A., 26, 1246 (1937).
(2) Husa, W. J., and Magid, L., *Ibid.*, 23, 1190 (1934).
(3) Husa, W. J., and Huyck, C. L., *Ibid.*, 27, 290 (1938).
(4) Husa, W. J., and Fehder, P., *Ibid.*, 24, 615 (1935).

Establishment of a new laboratory for the study of filterable virus diseases, in the treatment and prevention of which science is believed to be at the threshold of an important advance, is announced by the Squibb Biological Laboratories.

Dr. Raymond C. Parker, biologist of the Rockefeller Institute for Medical Research, and for many years an associate of Dr. Alexis Carrel, has been appointed to head the laboratory, which will operate as a unit of the Biological Division of E. R. Squibb and Sons at New Brunswick, N. J. The new building is a continuation of a program of expansion which began in the fall of 1938 with the dedication to pure science of the $750,000 laboratory of the Squibb Institute for Medical Research.

HYDROGENATED CASTOR OIL AS AN OINTMENT BASE. IV. HYDROXYSTEARIC ACID.*

BY GEORGE W. FIERO.[1]

Castor Oil differs chemically and physically from practically all other commercial fixed oils in that it contains a very large amount of ricinoleic acid. Likewise completely hydrogenated castor oil differs both chemically and physically from other hydrogenated oils in that it contains a large amount of 12-hydroxystearic acid (dihydro-ricinoleic acid). The fatty acid may be freed from the oil by usual methods: alcoholic saponification, catalytic hydrolysis under pressure, aqueous saponification, etc. Because of the high melting point of the oil (86° C.) and the comparatively low water solubility of the soaps, aqueous saponification was not as satisfactory as the other two methods. The fatty acid is a hard white solid, soluble in hot alcohol and hot liquid petrolatum.

EXPERIMENTAL.

Characteristics of Salts.—Salts were prepared using equivalent weights of hydroxystearic acid[2] and the base. In the case of inorganic bases, a concentrated aqueous solution was mixed with the melted fatty acids, stirred and dried at 105°. In the case of inorganic bases, the amine was added to the melted fatty acid, stirred and cooled.

Inorganic Salts.—Salts of sodium potassium and ammonium were white solids, soluble in hot water and hot alcohol. Salts of calcium, lead and aluminum were white solids practically insoluble in water and alcohol.

Triethanolamine.—Amber-colored solid, soluble in water, alcohol and hot liquid petrolatum, less soluble in the latter than isopropanolamine salts, forming a gel upon cooling.

Triisopropanolamine.—Pale straw-colored solid, softer than the above, soluble in water, alcohol and hot liquid petrolatum.

Mixed Isopropanolamines.—Pale straw-colored solid, softer than the above, soluble in water, alcohol and hot liquid petrolatum.

Physical Properties of Solutions.—Solutions (0.14%) of various salts of hydroxystearic acid were tested in the same manner as salts of other fatty acids previously reported (1). The data with the exception of surface tension (45° C.), were obtained at 22° C. Table I indicates a comparison of salts of hydroxystearic acid with stearic acid (1) and ricinoleic acid.

TABLE I.—CHARACTERISTICS OF SALTS.

(0.14% Aqueous Solutions.)

Salt.	Surface Tension (45°).	Lather (22°).	PH.
Triethanolamine Hydroxystearate	40.5	35%	8.5
Triethanolamine Stearate	40.4	0	8.3
Triethanolamine Ricinoleate	..	18%	7.3
Triisopropanolamine Hydroxystearate	39.9	30%	8.1
Triisopropanolamine Stearate	33.3	10%	8.3
Triisopropanolamine Ricinoleate	..	25%	7.1
Mixed Isopropanolamine Hydroxystearate	40.5	40%	8.5
Mixed Isopropanolamine Stearate	33.8	5%	9.2
Mixed Isopropanolamine Ricinoleate	..	15%	7.3

Emulsions.—Liquid petrolatum emulsions were prepared by dissolving the fatty acid in hot mineral oil (25%) and the base in water as previously reported for other fatty acids (*loc. cit.*).

* Presented before the Section on Practical Pharmacy and Dispensing, A. PH. A., Atlanta meeting, 1939.

[1] University of Buffalo, School of Pharmacy.

[2] Manufactured by National Oil Products Co., Harrison, New Jersey.

After agitation with a mixer for 15 seconds, and standing 48 hours, the condition of emulsion was recorded. As with other fatty acids there was a tendency to "cream" without breaking the emulsion. In many cases with 5% and 2½% emulsions the "cream" was quite solid, but readily became homogenous when shaken; data are shown in Table II.

TABLE II.—EMULSIONS.

Salt of Hydroxystearic Acid	5%.	2.5%.	1.0%.	0.5%.	0.25%.
Sodium	+	90% C	70% C	60% C	50% C
Potassium	30% C	25% C	25% C	25% C	10% C
					15% O
Ammonium	+	30% C	25% C	20% C	10% C
				5% O	15% O
Triethanolamine	+	90% C	70% C	20% C	10% C
				10% O	15% O
Triisopropanolamine	85% C	85% C	85% C	15% C	10% C
				15% O	20% O
Mixed Isopropanolamines	25% C	50% C	75% C	50% C	30% C

Legend: + = perfect emulsion; C = cream; O = oil.

Cosmetics.—Creams were prepared in the same manner previously reported (*loc. cit.*) using the following basic formula:

White Wax	15 Gm.
Hydroxystearic Acid	*q. s.*
Heavy Liquid Petrolatum	50 cc.
Distilled Water	30 cc.
Base (hydroxide or amine)	*q. s.*

Molecular equivalents of the fatty acid were dissolved in the oil and wax and the base in water; the two liquids, heated to the same temperature, were agitated for a few seconds with a mechanical stirrer and allowed to cool without further agitation. After standing five months in an open glass vessel color was observed. Data are shown in Table III.

TABLE III.—CREAMS.

Salt.	5.0%. A	5.0%. B	2.5%. A	2.5%. B	1.25%. A	1.25%. B	0.60%. A	0.60%. B	0.30%. A	0.30%. B	0.15%. A	0.15%. B	0.08%. A	0.08%. B
Sodium	+	1	+	1	+	1	+	1	−	1	−	1	−	1
Potassium	+	1	+	1	+	1	+	1	+	1	+	1	+	1
Ammonium	+	2	+	3	+	3	+	2	−	1	−	1	−	1
Triethanolamine	+	4	+	3	+	2	+	1	+	1	+	1	+	1
Triisopropanolamine	+	2	+	1½	+	1	+	1	+	1	+	1	−	1
Mixed Isopropanolamines	+	2	+	1½	+	1	+	1½	+	1½	+	1	−	1

Legend: + = good emulsion; − = separated; column A indicates condition while cooling; column B after 5 months; color indicated by numbers white (1) to amber (4).

Vanishing Cream.—Most vanishing creams consist of an emulsion of stearic acid, the emulsifying agent often being a salt of stearic acid. Vanishing creams were prepared with several alkalies using hydroxystearic acid, stearic acid, and mixtures of the two. The following basic formula was used:

Fatty acid	20 Gm.
Water	80 cc.
Base	*q. s.*

The water containing the base was heated to the same temperature as that of the melted fatty acid and poured into it. The mixture was agitated for a few seconds with a slowly moving

mechanical mixer. Hydroxystearic acid was substituted for stearic acid as follows: 100%, 75%, 50% and 25% hydroxystearic with balance stearic acid, U. S. P. After standing five months in sealed glass jars, the creams were examined for consistency; the state of emulsion was obtained by heating the creams for 24 hours in an oven at 90° C and examining them while in a molten condition. Results are shown in Table IV.

TABLE IV.—VANISHING CREAMS.

Base.	Amount.	100%. A	100%. B	75%. A	75%. B	50%. A	50%. B	25%. A	25%. B	0%. A	0%. B
Potassium hydroxide KOH	1.5%	G		+	T-O	+	0% O	+	0% O	+	0% O
					100% C	l	40% C	L	60% C	L	75% C
	0.75%	G		+	10% O	+	10% O	+	10% O	+	5% O
					5% C	l	25% C	L	40% C	L	30% C
Triethanolamine TEA	2%	+	5% O	+	0% O	+	+	+	T-O	+	T-O
			20% C	h	75% C				100% C	L	95% C
	1%	+	5% O	+	T-O	+	5% O	+	5% O	+	5% O
			20% C		100% C		85% C		80% C	l	95% C
Triisopropanolamine TIA	2%	G	10% O	G	....	g	....	+	10% O	+	10% O
		H	90% C	H		H		H	90% C	H	90% C
	1%	G	15% O	G	....	g	....	+	10% O	+	18% O
		H	85% C	H		S		l	90% C	l	5% C
Mixed Isopropanol-amines MIA	2%	+	5% O	+	10% O	+	10% O	+	10% O	+	10% O
		H	85% C	H	30% C	H	15% C		60% C	L	85% C
	1%	G	10% O	G	15% O	+	10% O	+	10% O	+	10% O
		H	85% C	S	5% C		15% C		40% C	l	50% C
Mixture KOH TEA	0.5	+	O% O	+	T-O	+	+	+	1% O	+	10% O
	1.0		75% C		100% C			l	99% C	L	70% C
Mixture KOH TIA	0.5	+	5% O	+	5% O	G		+	10% O	+	10% O
	1.0	h	95% C		50% C	S			20% C	L	90% C
Mixture KOH MIA	0.5	+	5% O	+	5% O	+	5% O	+	8% O	+	10% O
	1.0	h	20% C		50% C	h	50% C		30% C	L	90% C

Legend: + = satisfactory; H = hard; h = slightly hard; S = soft; G = granular; T = trace; O = oil; C = cream; L = luster; l = slight luster; column A—consistency after standing 5 months; column B—state of emulsion of melted creams 5 months old.

Ricinoleic Acid.—In order to illustrate the differences between the fatty acid of hydrogenated castor oil and of untreated castor oil, the experiments were duplicated using the mixed fatty acids of castor oil (chiefly ricinoleic acid).[1] This substance, unlike hydroxystearic acid, was insoluble in mineral oil.

TABLE V.—EMULSIONS OF RINCINOLEATES.

Salt of Ricinoleic Acid.	5%.	2.5%.	1.0%.	0.5%.	0.25%.
Sodium		25% O	26% C	25% C	15% C
		T C	3% O	5% O	11% O
Potassium	24% C	23% C	22% C	21% C	4% C
	2% O	3% O	5% O	7% O	21% O
Ammonium	26% C	25% C	23% C	23% C	11% C
	T O	1% O	2% O	4% O	16% O
Triethanolamine	27% C	27% C	27% C	27% C	3% C
			T O	2% O	23% O
Triisopropanolamine	29% C	26% C	26% C	26% C	5% C
	T O	1% O	2% O	3% O	20% O
Mixed Isopropanolamines	28% C	27% C	27% C	21% C	3% C
	T O	1% O	3% O	7% O	22% O

Legend: C = cream; O = oil; T = trace.

[1] Courtesy of Woburn Degreasing Co. of New Jersey, Harrison, N. J.

Emulsions.—The emulsions were prepared in the same manner as those with hydroxystearic acid with the exception that heat was not required to maintain the oil in a liquid state.

Cosmetics.—Creams were prepared in the same manner as with hydroxystearic acid.

TABLE VI.—CREAMS WITH RICINOLEATES.

Salt of Ricinoleic Acid.	5%. A	5%. B	2.5%. A	2.5%. B	1.25%. A	1.25%. B	0.60%. A	0.60%. B	0.30%. A	0.30%. B	0.16%. A	0.16%. B	0.008%. A	0.008%. B
Sodium	+	1½	+	1	+	1	+	1	+	1	+	1	−	1
Potassium	+	1½	+	1½	+	1	+	1	+	1	+	1	−	1
Ammonium	+	3	+	3	+	2	+	2	+	1½	+	1½	−	1
Triethanolamine	+	4	+	4	+	3	+	2	+	1	−	1	−	1
Triisopropanolamine	+	2	+	1½	+	1½	+	1	+	1	−	1	−	1
Mixed Isopropanolamines	+	3	+	3	+	3	+	2	−	1	−	1	−	1

Legend: + = good cream; − = separated; column A indicates condition while cooling; column B, after 5 months. Color indicated by numbers white (1) to amber (4).

Stearic Acid.—Stearic acid, which differs from hydroxystearic acid only by the hydroxy group, has previously been shown to have the following properties when combined with an alkylolamine (1); the data in Table VII and VIII were obtained in the same manner as hydroxystearic preparations.

TABLE VII.—EMULSIONS OF STEARATES.

Salt of Stearic Acid.	5%.	2.5%.	1.0%.	0.5%.	0.25%.
Triethanolamine	+	+	+	25% C	15% C
				3% O	12% O
Triisopropanolamine	+	+	30% C	23% C	15% C
			T O	2% O	10% O
Mixed Isopropanolamines	+	+		32% C	24% C
					1% O

TABLE VIII.—CREAMS WITH STEARATES.

Salts.	5%. A	5%. B	2.5%. A	2.5%. B	1.25%. A	1.25%. B	0.6%. A	0.6%. B	0.3%. A	0.3%. B	0.16%. A	0.16%. B	0.008%. A	0.008%. B
Triethanolamine	+	+2½	+	+2	+	+1½	?	−1	?	−1	−	−1	−	−1
Triisopropanolamine	+	+2	+	+2	+	+1	+	−1	−	−1	−	−1	−	−1
Mixed Isopropanolamines	+	+4	+	+3	+	−2	+	−1	+	−1	+	−1	−	−1

DISCUSSION.

Hydroxystearic acid, obtained as the fatty acid saponified from hydrogenated castor oil, possesses properties different from other fatty acids including ricinoleic acid, from which it differs by two hydrogen atoms, and stearic acid, from which it differs by one oxygen atom. Salts of hydroxystearic acid with alkylolamines are, as would be expected, more solid than those of stearic acid. Creams prepared with those salts did not become colored to as great an extent upon aging as those prepared with salts of ricinoleic or stearic acid. Vanishing creams prepared with hydroxystearic acid alone were not as satisfactory as those prepared with a mixture of hydroxystearic and stearic acids. They did not possess the luster found in stearic acid vanishing creams.

SUMMARY.

Salts of hydroxystearic acid obtained from completely hydrogenated castor oil were prepared and their characteristics reported. Emulsions and cold creams compared with those prepared with ricinoleic stearic acids. Vanishing creams

were prepared with hydroxystearic acid and with mixtures of hydroxystearic and stearic acids.

Alkylolamine salts of hydroxystearic acid were superior emulsifying agents compared with those of ricinoleic acid and practically equal to those of stearic acid.

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QUALIFICATIONS OF THE PERSONNEL FOR A PROFESSIONAL PHARMACY.*

BY J. K. ATTWOOD[1]

The success of a professional pharmacy is dependent to a great extent upon the ability of the proprietor to select and train the proper type individuals as members of his staff. The selection of an efficient worker is far from a simple matter and cannot be done casually. There are many requirements of the staff members of a professional pharmacy that are not essential to the average drug store.

Twenty-five years ago the stocks of most drug stores were about the same, but within the past two decades, especially the last, a tremendous change has taken place. Modern methods of merchandising have entirely changed the appearance of the drug store of a quarter century ago. A merchandising phobia seems to have engulfed many stores and there is frequently nothing to suggest what our profession really is. All of you are familiar with this change. The many jokes about the articles sold in drug stores has not dignified our profession. Those of us operating professional stores resent such humor.

In the selection of pharmacists for our type stores, the first consideration is education, of course. Take sufficient time in interviewing applicants to ascertain all facts possible pertaining to their qualifications for the position.

1. Education and Intelligence. He must be a graduate of a recognized college with fairly high marks, at least one of top six.

2. A genuine and sincere interest in Pharmacy is necessary. He should be anxious to read drug and medical Journals so as to be informed, and be capable of discussing the new developments of his profession when the occasion arises. None of these can be forced. There must be a desire already created and deeply rooted.

3. He must possess or acquire a professional manner. Calm, dignified, but friendly. A successful physician must have that hard-to-describe asset, a good bed-side manner. The pharmacist must have a store manner which inspires confidence and assures the customer that the prescription is not just a scrap of paper, but something that will receive careful attention and be filled with utmost exactness and skill. The manner in which a pharmacist accepts a prescription is important. Avoid an attitude of indifference. Every day opportunities are provided for the pharmacist to build confidence.

4. Personality. After talking to him do you like him? First impressions are not always lasting, but they are important. A grouch or trouble-maker can wreck an entire organization.

5. Character. Investigate his past record carefully. I am inclined to believe once a thief always one if the opportunity presents itself. Does his former employer speak well of him? Recommendations are of little value. Get a confidential report and treat it so. Will he be loyal and coöperative?

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[1] Retail Pharmacist, Jacksonville, Fla.

6. Personal Habits. Does he drink to excess or is he a teetotaler? How does he spend his spare time? Reading, good movies or jook joints? What type girls does he enjoy being with if he is unmarried? Flashy flogies or educated intelligent girls? Does he go to church?

7. Coöperation. This is vital. Will he endeavor to carry out your instructions and endeavor to do things as you wish them or will he be the know-it-all type and do it his way. If he does not promptly demonstrate his willingness to work pleasantly and smoothly with your organization get rid of him as quickly as possible. The tremendous success that has come to certain firms is unquestionably due to a large extent to the careful and intelligent selection of workers.

While I have been delivering this little talk, many of you may be thinking—"My staff is satisfactory and I do not need to bother about new employees," but you can never tell just when you will need additional help and I believe it is wise to interview likely-appearing applicants and have them fill out your regular blank after your interview, to indicate your impression of him and grade him accordingly. It is good practice and may be needed before you expect.

These suggestions are made with the hope that it will arouse a greater interest in this particular phase of our business. After twenty-five years I have learned that too much thought can not be given to the selection of your personnel. Had I made this analysis of all employees, I would have saved many hours of worry and a great deal in dollars and cents.

BACK TO PHARMACY.*

BY EMERSON D. STANLEY.[1]

For the past several years there has been an ever increasing tendency on the part of many physicians to limit writing of prescriptions to preparations or mixtures of preparations bought ready made by the pharmacist. It is not the purpose of this paper to delve into the contributing fators to this situation. It is merely presentation of the program instigated by one pharmacy directly faced with this problem. This pharmacy has been noticing for quite some time a gradual decrease in the number of prescriptions that required actual compounding. Increasing proportionately in number were prescriptions for preparations or mixtures thereof bought ready made. The filling of these latter prescriptions, requiring only, or little more than transfers into different containers, could hardly be classified as actually compounded.

This pharmacy felt that an effort made to check this trend would prove to be of mutual benefit to the patient, the physician and the pharmacist. What was termed a "Back to Pharmacy" program was undertaken the latter part of August 1938. For the initial step in this program the following prescription was selected.

℞	Strychnine sulfate	gr. 1/5
	Distilled water	fl. dr. 2
	Saccharated ferrous carbonate	gr. 320
	Pancreatin	gr. 160
	Tincture of vanilla	fl. dr. 4
	Malt extract, diastasic	
	Cod liver oil of each to make	fl. oz. 16
M. Label: tablespoonful three times daily.		

* Presented before the Section on Practical Pharmacy and Dispensing, A. PH. A., Atlanta meeting, 1939.

[1] First Central Dispensary, Madison, Wis.

This prescription was not an original one and the method of compounding should not require any comment. It was selected for the following reasons. *First*, it was a palatable type of prescription that would be freely prescribed during the coming months; *second*, it was of long standing and had been successfully prescribed in past years by prominent physicians; and *third*, it presented an ideal prescription for variation of ingredients and their dosage to meet the particular requirements for individual patients. The latter reason being of special importance when the prescription was presented to the physician for consideration. The dosage of the strychnine sulfate, saccharated ferrous carbonate and pancreatin could be prescribed as best suited the patient. Should any of these ingredients be undesired, they could be omitted or replaced by innumerable others. Tinctures such as nux vomica, gentian or gentian compound could be prescribed instead of strychnine sulfate. Practically any iron salt desired could be substituted for the saccharated ferrous carbonate. Elixirs such as lactated pepsin, gentian and phenobarbital could be incorporated. In cases where the cod liver oil presented an objection, it was found best to replace the oil with distilled water and malt extract, the amount of water used being small if an insoluble iron salt and pancreatin were used. If all water soluble ingredients were used the oil could satisfactorily be replaced with equal parts of distilled water and malt extract.

In addition to fully acquainting the physician with the wide variability of the prescription, the palatability and former successful usage were brought to his attention. Further, an attempt was always made to discuss with the physician the disadvantages of prescribing some preparation that was apt to be quite well known, either through advertising or counter display, to the laity. Also the physician was cautioned about the possible errors that might occur when the patient was told verbally what to take or use, and reminded that such possible errors could not occur when a written prescription was given. In conclusion the physician was informed that this pharmacy was ready at all times to suggest or help work out variations of any type of prescription to meet the particular requirements for the patient. The majority of the physicians contacted showed a very marked interest and all expressed a willingness to give some variation of this prescription a trial at the first opportunity.

To obtain some definite basis by which to judge the results of this work, the following tabulations were taken from the prescription files of this pharmacy. Table I from the first nine months following the presentation of this prescription to the physicians and Table II from the corresponding months of the year before.

TABLE I.—TABULATION OF MALT TONIC PRESCRIPTIONS FILLED SEPTEMBER 1938 THROUGH MAY 1939.

	Actually Compounded.			Bought Ready Made.		
	Prescriptions Filled.	Variations.	Physicians Writing.	Prescriptions Filled.	Variations.	Physicians Writing.
1938						
September	15	4	4	3	3	3
October	16	5	5	5	3	3
November	22	5	4	11	5	5
December	19	5	3	3	3	3
1939						
January	18	7	4	7	4	4
February	18	5	4	4	4	4

March	36	6	6	4	4	4
April	22	7	4	1	1	1
May	20	6	6	0	0	0
Nine Months	186	10	10	38	11	10

TABLE II.—TABULATION OF MALT TONIC PRESCRIPTIONS FILLED SEPTEMBER 1937 THROUGH MAY 1938.

	Actually Compounded.			Bought Ready Made.		
	Prescriptions Filled.	Variations.	Physicians Writing.	Prescriptions Filled.	Variations.	Physicians Writing.
1937						
September	0	0	0	18	5	5
October	1	1	1	26	3	5
November	0	0	0	12	5	6
December	1	1	1	8	5	5
1938						
January	0	0	0	9	4	5
February	3	1	1	21	8	7
March	1	1	1	11	6	3
April	0	0	0	9	4	4
May	1	1	1	4	2	2
Nine Months	7	2	2	108	13	12

These tabulations were for new prescriptions only, as no records were kept on refills. Changes in dosages of ingredients were not considered variations.

TABLE III.—COMPARISON OF ACTUALLY COMPOUNDED AND BOUGHT READY MADE MALT TONIC PRESCRIPTIONS FOR THE TWO NINE-MONTH PERIODS.

	Total Number. Filled.	Actually Compounded. Number.	Actually Compounded. Per Cent.	Bought Ready Made. Number.	Bought Ready Made. Per Cent.
September 1938–May 1939	224	186	83	38	17
September 1937–May 1938	125	7	5	108	95

From the standpoint of the pharmacy the increase from five to eighty-three per cent in actually compounded prescriptions made the effort extended well worth while and it could not help but be felt that the increase in total number of malt tonic prescriptions filled was partially due to less verbal prescribing, a habit so easily acquired by the physician when giving this type of medication.

More gratifying has been the physicians' repeated expressions of the fine therapeutic results obtained and continued requests for information on other types of prescriptions. In fact, the "Back to Pharmacy" program needs no further step with several of these physicians, they have taken over the initiative.

While no definite study was made of the comparative costs to the patient, it can safely be stated that the average cost of the actually compounded is considerably less than the average cost of the bought ready-made prescription of this type.

From the patient came many expressions of the results they were receiving, especially in regard to gaining of weight. Contrary to expectations there were not many patients who strenuously objected to the cod liver oil taste. Frequently patients would remark that they did not care at all for the taste of the prescription at first, but now they did not mind it. On several occasions patients expressed surprise when catching a glimpse of the pharmacist mixing his prescription in a large mortar, stating that they thought all drug stores bought medicines in large containers and merely put them into smaller ones.

This type of "Back to Pharmacy" contact work with the physicians will prove of mutual benefit to the patient, the physician and the pharmacist.

OUR HOSPITAL PHARMACISTS' ASSOCIATION.*

BY JOHN F. MILLER[1] AND RUSSELL H. STIMSON.[2]

Just as history has been made in the past, so will it be made in the future. The future of Pharmacy, especially hospital pharmacy, will depend on each and every one of us interested in hospital pharmacy if it is to be successful.

You all remember that the AMERICAN PHARMACEUTICAL ASSOCIATION was founded in 1852 by a group of twenty-four men who were interested in the future of Pharmacy. Its aim was to unite the educated and reputable pharmacists of America. The objects of the ASSOCIATION, as set forth in their constitution, are worth repeating:

"1. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among pharmacists, druggists, physicians and the people at large as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment in order to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

6. To uphold standards of authority in the educational theory and practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection of the public."

These objects have been carried out by this ASSOCIATION for a period of eighty-seven years. Therefore, as you see, this great ASSOCIATION was not built in a day or a year, but it has taken decades of hard work from many enthusiastic workers.

The advance of hospital pharmacy has given the ASSOCIATION a new mark for achievement, and all hospital pharmacists should realize that now is the time to make hospital pharmacy a recognized professional, specialized field. The only way that this can be successfully accomplished is to have local and state organizations, which may or may not be affiliated with the AMERICAN PHARMACEUTICAL ASSOCIATION.

The AMERICAN PHARMACEUTICAL ASSOCIATION has emphasized that state and local associations are essential and that every effort should be made to interest the pharmacists enough to join them. The national ASSOCIATION could deal only with the nation-wide problems, and it is through the local groups that the men themselves will be of greatest assistance to one another. They can have meetings frequently and accomplish many of the local hospital pharmacy problems.

When forming these local or state groups, one must not forget that the AMERICAN PHARMACEUTICAL ASSOCIATION is the mother of all pharmaceutical as-

* Presented before the Sub-Section on Hospital Pharmacy, A. PH. A., Atlanta meeting, 1939.

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[2] Chief Pharmacist, Huron Road Hospital, Cleveland, Ohio.

sociations. Every pharmacist, whether he is engaged in the administrative, scientific or pharmaceutical work, should feel it his duty to be a member of the AMERICAN PHARMACEUTICAL ASSOCIATION and as many other pharmaceutical groups or societies as he can afford. Thus, if he is engaged in retail pharmacy, he should be a member of the national organization as well as a local or state retail pharmacists' association. I think I am safe in saying, however, that the majority of men in the retail trade do belong to a local retail association, particularly in our city. If the pharmacist is in the scientific or teaching field, he, too, should belong to the national association as well as to a local, state educational group. If he is in the manufacturing field, the same rule should apply.

The hospital pharmacist should be a member of the AMERICAN PHARMACEUTICAL ASSOCIATION and support this Hospital Pharmacy Sub-Section to the best of his or her ability. At the same time, he should coöperate in the creation of a local or state hospital pharmacists' society. Let me repeat, I personally feel that every pharmacist, no matter in what field he may have specialized, should support the AMERICAN PHARMACEUTICAL ASSOCIATION and a group representing his particular branch of Pharmacy.

In our city, the "Academy of Pharmacy," which is a branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, is made up chiefly of retail pharmacists, and their meetings are devoted, in the main, to retail problems, and it is, therefore, of no particular interest to the hospital pharmacists. In turn, if hospital pharmacy problems were discussed, the retail pharmacists would not be interested. Hence, the Hospital Pharmacists' Association was founded as a separate organization.

I have given you this short introduction in order to acquaint you with the reasons for the forming of our Hospital Pharmacists' Association, better known as the "Cleveland Society of Hospital Pharmacists."

Our Association was founded just slightly over a year ago in April 1938, when a group of hospital pharmacists of our city met in a downtown restaurant. The meeting was called to determine how we might arrange a get-together in order to discuss hospital pharmacy problems. Following the fellowship afforded by having dinner together, there was considerable discussion resulting in the motion "that we form a local hospital pharmacists' association and have a meeting each month except during June, July, August and December." Officers were elected and a committee was appointed to draw up a constitution.

The meetings are held at different hospitals and occasionally at the School of Pharmacy of Western Reserve University. Dean Spease, of the School of Pharmacy, is very active in hospital pharmacy as he is Directing Pharmacist of University Hospitals of Cleveland.

Our second meeting was held at Western Reserve University, and the proposed constitution was acted upon and accepted as follows:

ARTICLE I. The Name and Objects:
The name of the society shall be "The Cleveland Society of Hospital Pharmacists."
The objects of the society shall be:

1. To promote the advancement of the pharmaceutical sciences.
2. To elevate the status of hospital pharmacy.
3. To provide a coöperative understanding of the problems of hospital pharmacy.

The other articles have to do with membership, application of membership, dues, officers, standing committees, duties of officers, duties of standing committees, meetings and amendments.

I would like to elaborate a little on our meetings, but let me first explain that our group is made up of pharmacists from several types of hospitals—government, state, city, private, university, profit and non-profit institutions. Most of the hospitals are general hospitals with the exception of one, which is an institution for the feeble-minded.

The first meeting of the newly-formed society was held in September 1938, at St. Luke's Hospital. We had a very interesting subject presented by one of our pharmacists, Evelyn Gray Scott, who devotes her full time to the making of sterile solutions for this large hospital. Many of her ideas were discussed and much was learned by every member present. She illustrated to us how the solutions were actually prepared in order that the information would be of more value to us.

The second meeting was held at Huron Road Hospital where the intravenous sterile solutions are purchased by the pharmacist. His paper was given on the pro and con of buying or manufacturing of sterile solutions. He brought out many factors which must be considered before an institution decides whether to make or purchase the solutions. Some of the factors that were pointed out were as follows:

1. Does the hospital have sufficient dust-proof rooms for making them?
2. Does the hospital have sufficient money to buy the essential equipment?
3. Does the hospital have a good water supply for making distilled water?
4. Does the hospital pay for water?
5. How much extra help will it be necessary to employ?

There were many more factors which I will not have time to give in this paper, but would be glad to furnish them upon request.

Our third meeting was held at Mt. Sinai Hospital. Dr. D. S. Kline, a guest speaker, presented a very interesting paper on syphilis and the Kline Test for syphilis.

The fourth meeting was held at Cleveland City Hospital, and again we had a guest speaker. Dr. C. Garvin presented a paper on "The Treatment of Pneumonia," and the use of drugs, serums and chemotherapy was discussed.

Our fifth meeting was held at University Hospitals and two very worthwhile subjects were given. The first one was by Mr. Roger Lager, the chief pharmacist, on "The Function of the Pharmacy Committee," and the other, by Miss Gertrude Horsch, was on "Narcotic Control within the Institution."

Our sixth meeting at United States Marine Hospital was also of considerable interest. The pharmacist, Mr. Paley, presented a paper on "United States Public Health Service and the Relationship to the Pharmacist." He gave us an idea of how the government hospital purchased their drugs, how they were restricted on their number of requisitions, and why he, too, purchased sterile intravenous solutions.

The seventh meeting was held at Akron City Hospital, which is located about thirty-five miles from Cleveland. The chief pharmacist, Mr. Edward Miller, had arranged through their hospital assistant director, Mr. Robert Porter, a trip through the Goodyear Rubber Plant. After the trip, Mr. Porter, who was pre-

viously pharmacist at University Hospitals in Cleveland, gave a paper in the development of anode rubber and its uses in the hospital. Items, such as anode tubing, anode gloves, anode hot water bottles, and throat collars were discussed. It was found that the anode tubing and gloves had a larger number of sterilizations than the ordinary brown rubber.

Our eighth meeting and last meeting for the year was held at a local restaurant. Election of officers took place and a general good time was afforded to all present.

During the year our society was asked to help to instigate the forming of a State Hospital Pharmacists' Association. We did considerable work for the organization of this association, and I feel assured that it was through our efforts that the Ohio Hospital Pharmacists' Society was founded. Two of our local members are officers in this state society.

I hope that I have given you a clear picture of the reason for my intense enthusiasm about our Hospital Pharmacists' Association. You can readily see that there are great possibilities and that the hospital pharmacists, themselves, are making great strides to better the future and encourage the advancements of hospital pharmacy.

May I say in closing that it is my sincere wish that every hospital pharmacist or any pharmacist who is working with a hospital should support this sub-section and help to create local groups, in order that they may build up the feeling that the hospital pharmacy is an important department in the institution. It is no longer just a hole in the wall, but it is a department just as important and necessary as surgery, x-ray, laboratory, medical and dietary departments and it should be supervised by trained pharmacists who have had special hospital pharmacy courses or interneship.

COMMERCIAL AND PROFESSIONAL PROBLEMS IN RETAIL PHARMACY ARE DISTINCT BUT INSEPARABLE.*

BY PAUL C. OLSEN.[1]

The practice of Pharmacy in retail drug stores is unique among the professions in that commercial activities proceed simultaneously with professional practice. This close connection between the professional services of Pharmacy and retail trade has caused some people to conclude that retail pharmacy is a trade and not a profession.

The professional responsibilities of retail pharmacists require here no explanation nor defense. Many of the business activities which are a customary part of the responsibilities involved in the conduct of a drug store arose from advances in Pharmacy and related professions and sciences. Half to three quarters a century ago it became apparent that there were some medicinal substances and preparations which could be prepared most economically in manufacturing establishments.

This trend has not relieved retail pharmacists of professional responsibilities. They still must assume these professional responsibilities in the selection of these

* Presented before the Section on Pharmaceutical Economics, A. PH. A., Atlanta meeting, 1939.

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manufactured articles for their stocks and in their storage, preservation and dispensing. Even in the sale of manufactured articles intended for self medication, retail pharmacists have had a responsibility, particularly with respect to those articles containing narcotics and poisons. With the partial formula disclosure provisions of the Federal Food, Drug and Cosmetic Act of 1938, these professional responsibilities with respect to manufactured proprietary medicines intended for self medication have been increased because the partial formula disclosure supplies to retail pharmacists information that may be used to warn patrons against improper or dangerous use of these articles.

In a department apparently so unrelated to the practice of Pharmacy in drug stores as the soda fountain, there is a definite and historical relationship to traditional professional responsibilities. Carbonated water, the basis of the soda fountain, has its therapeutic uses in addition to its uses as an important ingredient in many delightful beverages.

Even when there were relatively few packaged articles sold in drug stores, retail pharmacists had to have commercial arrangements with various wholesale druggists, manufacturers and other sources of supply for the articles prepared and dispensed in their stores. With the growth in the number of packaged articles of standardized size and quality, the commercial problems involved in the practice of Pharmacy in retail drug stores have increased, but there has been no diminution in the professional duties and responsibilities of retail pharmacists.

Just as advances in medical science have immensely increased the amount of training that physicians must receive before they are competent to practice Medicine, so have increased in like degree the knowledge and training required of retail pharmacists. In addition, retail pharmacists must possess a knowledge of commercial methods and practices of ever increasing complexity. Retail pharmacists of the present day can no more serve with full satisfaction to their customers and themselves without an adequate knowledge of commercial practices than they can without a similarly complete experience and understanding of professional methods. It is for this reason that the AMERICAN PHARMACEUTICAL ASSOCIATION has maintained for more than fifty years the section which is now called the Section on Pharmaceutical Economics and at each of its annual meetings has devoted a portion of its program to discussions on this subject.

The increase in the number of medicinal articles offered for sale in drug stores in packaged form resulted in the development of trade practices which, in turn, caused among retail pharmacists as far back as half a century ago, demands for legal restrictions upon unfair trade practices.

The ultimate result of the agitation for this control has been the enactment in forty-four of our states of laws which permit owners of trade-marked merchandise to make legally binding resale price agreements with their wholesale and retail distributors. These laws have greatly reduced the unfair trade practices which formerly existed in the sale of many packaged articles sold in drug stores.

It is manifestly impossible for any retailer to sell merchandise for less than he paid for it and remain long in business. If, however, he chooses a few well-known articles from his stock and sells them for less than he paid for them, he may succeed in creating the impression that everything in his store is sold at similarly reduced prices. Competing retailers who price all of their merchandise at figures which

permit them to recover their costs are obviously at a difficult and frequently insurmountable disadvantage against such deceitful competition. Resale price agreements have eliminated this kind of competition for many of the most popular articles sold in drug stores. There also exist in nearly half the states laws which are out and out prohibitions of retaining or wholesaling any article below cost. Sometimes these laws are called unfair practices acts while in other states they have been named unfair sales acts.

With these efforts to eliminate by law the deceitful use of sales below cost as a means of attracting trade, no one can have a legitimate quarrel yet there are interests all over the United States who are actively working now for the repeal of these unfair practices and fair trade laws. No one should underestimate the strength or the ability of these opponents.

The demand for the repeal of these laws is not being directed at the principle the laws are designed to protect but rather at the abuses, real and fancied, which have occurred in the operation of these laws. If retail pharmacists will remember that neither fair trade laws nor unfair practices acts are designed to guarantee them a profit but are instead designed to relieve them of the unfair competition of merchants who are selling goods for less than they paid for them, this agitation will lose much of its force. Thus commercial and professional interests, though distinctly different, are inseparable in retail pharmacy.

Another illustration is to be found in the state pharmacy laws. Every one recognizes that the retail distribution of many dangerous drugs and poisons is a responsibility which can be safely entrusted only to a person with professional knowledge and experience. That is why the state pharmacy laws impose restrictions on the retail distribution of various poisons and narcotics and entrust their sale only to retail pharmacists. Again retail pharmacists must recognize that this privilege is given to them for the protection of the public health and is not an award of a commercial monopoly. Any attempt to make from this privilege a commercial monopoly is bound to result in a public reaction which will bring general disapproval on the whole profession of Pharmacy.

In one state a persistent attempt has been made during recent years to limit to drug stores the retail sale of such household necessities as bicarbonate of soda and witch-hazel. The Legislature of this state took matters in its own hands this spring and now the pharmacy law has been so modified that retail merchants of every type and class may sell without professional supervision virtually every medicinal article except a few containing dangerous narcotics and poisons. That is what happens when an attempt is made to use for private gain a control that has been established for public health and safety.

There are drug stores in this country so poorly equipped that pharmaceutical practice cannot be conducted competently. Likewise, there are stores which, because of limitation of space and surroundings, cannot safely supply pharmaceutical services. To laws which specify the minimum standards of equipment for the practice of pharmacy in retail drug stores there can be no reasonable objection, but when the discretionary powers of the licensing authorities are used to prevent new stores from opening simply because that would mean more competition for the stores already in operation, there is an abuse of authority which inevitably must bring an adverse criticism of the entire profession.

I am not sure that there are too many drug stores in the United States but I am positive that there are entirely too many poorly located drug stores. Every day are to be seen drug stores operating in locations in which there is no need for additional pharmaceutical service and which, as a result, are not only certain to be professionally and commercially unsuccessful, but also by their presence will so cripple the existing stores that their ability to render satisfactory professional service is in danger. The choice of a suitable location for undertaking the retail practice of Pharmacy should be based upon adequate economic knowledge and not upon arbitrary legal restrictions.

Commercial education is the thing that will keep an ambitious but poorly informed pharmacist from offering his services in a location where they are not needed. Commercial education will inform a pharmacist that bank nights in his store have a narcotic effect which, with continued use, will only lead to disaster. Commercial education will teach him that the same amount of money, time and energy devoted to health education among his professional and lay patrons will bring lastingly beneficial results.

The form and extent of this commercial education has been a subject of discussion in this ASSOCIATION for forty years. I emphasize here the inseparable relationship that appears to me to exist between professional and commercial education in the practice of Pharmacy. Each is of fundamental importance and for the future welfare of Pharmacy neither should be neglected in the training of the pharmacists of the future.

Commercial education for the practice of Pharmacy includes a study of economic theory and of the economic problems of modern life. It should include a lecture, discussion and laboratory course in Psychology, a scientific field in which the knowledge of why we behave as we do is constantly expanding. While the study of English literature and composition by a pharmacist is not exclusively for his commercial interests, it is obvious that ability in written and oral expression is of inestimable value in commercial as well as in professional activities.

Marketing is the technical term usually applied by specialists in the field to the methods and problems involved in the distribution of goods from the places where they are produced and made to the places where they are ultimately consumed or used. Many unique and difficult problems arise in the marketing of drug products because of the closely intertwined professional and commercial problems. Marketing costs are a subject which is receiving an increasing amount of attention from economists generally and governmental authorities. Marketing costs in the drug trade are among the highest of any field and therefore are certain to be the subject of special inquiry. Stated thus academically, the problem may seem to have no special application to the pharmacist practicing in his own drug store, but when he hears of plans to distribute medicines and fill prescriptions through government owned dispensaries, in a general program of socialized medicine, he then will be quick to recognize just what a general inquiry into the costs of marketing of medicinal products means to him.

Another general commercial field upon which a retail pharmacist should be informed is the management problems involved in the operation of a drug store. These include a knowledge of the uses of the various articles which are for sale in drug stores and the most effective methods of presenting these uses to his patrons.

When there is a more general knowledge of these uses and the methods of presenting them effectively, drug store window and store displays will contain fewer cardboard cut-outs designed to promote the sale of articles wholly unrelated to Pharmacy and more displays that adequately picture the unique and invaluable services which are available in retail pharmacies.

Among the professions, retail pharmacy is unusual in that a far larger proportion of its gross income goes for the purchase of merchandise, supplies and operating costs than is characteristic of other professions. It therefore follows that, while a knowledge of finances and record keeping is of value in any profession, it is indispensable in the conduct of a retail drug store. I have had the opportunity in the past twelve years to examine the operating statements of more than three thousand individually owned drug stores. Many of these stores are outstandingly successful and from year to year have achieved steadily improved results.

Others have faults which, from an analysis of their operations, are readily recognizable and easily corrected. Many, many times I receive the answers, "I wish I had known what my trouble was ten years ago or twenty years ago. I'd be that much further ahead now." There is nothing especially difficult about analyzing the operations of a drug store but, to a person unfamiliar with the technique, it is as mysterious as osmosis or catalytic action. Yet how to analyze operating results is certainly an ability which every drug store proprietor should have.

While it has been a genuine satisfaction to point out to drug store proprietors the things they need to do to control their costs with more profit to themselves, it has always been most disturbing to me that the retail pharmacists most in need of such an analysis are the ones who do not get it. They cannot get it because they do not have a sufficiently complete or detailed record of their operations to make possible an analysis.

This failure to maintain adequate records results not so much from neglect nor from any lack of recognition of the importance of adequate records, but from a lack of understanding of just what are the records a drug store proprietor needs to guide his business. Accounting is a profession which requires study, training and experience comparable to that expected of a pharmacist. Fortunately the amount of accounting knowledge necessary to prepare adequate drug store records is not great, just as some of the professional tasks in the prescription department can be safely entrusted to the youngest apprentice.

I am perfectly well aware that, with the development of scientific knowledge in Pharmacy and allied sciences, the demands for inclusion of various subjects in a course of study steadily increase. The thing that I have been trying to make clear is that any neglect of commercial training for pharmacists is just as serious as a neglect of professional training. Failure to acquire an adequate knowledge in both fields means a burdensome handicap, if not outright failure for the retail pharmacist.

Exports of medicinals, pharmaceuticals and biologicals from the United States to South America were well maintained in 1938 with an advance over shipments during 1937, according to the Chemical Division, Department of Commerce. Total imports of the above-named products into South American countries are estimated at close to $20,000,000 yearly, of which the United States carries between 15% and 20%. It is likely that South American countries will look to the United States for an increasing share of such imports.

THE WETHERILL FAMILY IN PHILADELPHIA PHARMACY.*

BY JOHN E. KRAMER.[1]

The good name of Wetherill, the traditions of Pharmacy and the administration of the Philadelphia College of Pharmacy and Science have marched forward hand in hand for well over a century, 118 years, to be exact. This most interesting and seemingly inseparable trio, now in its fourth generation, so far as spans of human life are concerned, started in 1821 as an enterprise of youth, and they carry on to-day much in the same spirit.

Early in the nineteenth century, as we know only too well, the practice of the profession of Pharmacy was hectic, unorganized and, in some instances, quite unethical. There were no particular laws regulating the sale of drugs nor the quality of the drugs sold. Most drug stores were merely clearing houses for bulk medicinals of questionable value. To deal in these commodities one need learn only their names and the various prices. Chaos was the order of the day, with charlatans and those of "lesser conscience" far outnumbering the true practitioners of the art.

There were some, however, whose conduct of life and business would bear close scrutiny, and those of this group who resided in the provincial precincts of Philadelphia, the "City of Brotherly Love," and who were "desirous of obtaining the degree of Master of Pharmacy," were invited by the University of Pennsylvania to submit their credentials for appropriate action at the 1821 Commencement exercises of that institution, founded during the previous century by Benjamin Franklin.

This attempt of the University officials to recognize the work of those pharmacists who were outstanding was generally interpreted as an action which would lift them up only by submerging others. If, as was claimed, it was a genuine effort to "render the apothecaries a just tribute of respect, and awaken in them a proper esprit de corps," it achieved its purpose, even though not in the manner intended. For a group of sixty-eight apothecaries, resenting this attempt of a Faculty of Medicine to pass also upon the credentials of pharmacists, and sensing, too, that the general practice of Pharmacy was much in need of some supervision, met in Carpenters' Hall on February 23, 1821, and organized the College of Apothecaries, later to be known as the Philadelphia College of Pharmacy, and now the Philadelphia College of Pharmacy and Science. And the first Chairman of the first Board of Trustees of that organization was Samuel Price Wetherill.

Grandson of Samuel Wetherill, Sr., who had established a drug business at Front and Arch Streets in 1785, and third son of Samuel Wetherill, Jr., a father whose life's endeavor was the education of his four boys in the pure and applied sciences such as Chemistry, Pharmacy, Astronomy, Mineralogy and Horticulture, Samuel Price Wetherill was born in 1790. As he progressed under proud parental guidance he exhibited a marked aptitude and fondness for Chemistry and Botany, a trait and an achievement which made him the logical nominee for the post of presiding officer of the College's Board of Trustees in 1821, and his later election to the second vice-presidency of the institution. Aside from these positions of honor and service, his chief claim to fame came after his father's death when he inherited a large farm which he used almost exclusively for the culture of the

* Presented before the Section on Historical Pharmacy, A. PH. A., Atlanta meeting, 1939.

[1] Registrar, Philadelphia College of Pharmacy and Science.

finest variety of grapes. His success in this field was outstanding, the terraces of the farm overlooking a creek near Philadelphia being a mecca of interest for two or more decades after his untimely death in 1839, when he was still a young man intensely interested in his college duties, his chemical experiments and his avocation of grape-growing.

It is interesting to note that three others of the more than three-score intrepid young men who founded the first college of pharmacy in America bore the name of Wetherill—John P., George D. and Charles. In addition to this, six more of the Wetherill family either held membership in the College corporation or graduated from its prescribed courses of study within the first fifty years of its existence. Ashfield H. Wetherill held membership from 1824 until 1834, Dr. William Wetherill held membership from 1837 to 1872 and John Wetherill, Jr., was on the roster from 1837 until 1856.

In 1842, Samuel Wetherill, great-grandson of Samuel Wetherill, the first manufacturer of white lead in the United States, received the degree of Graduate in Pharmacy (Ph.G.), for which he qualified through study and through submission of a thesis on Juglans Cinerea. In later work with the New Jersey Zinc Company, this member of the family, the first one to hold membership, and, in addition, actually receive a diploma from the College, invented the Wetherill Furnace, for making metallic zinc, and also the Wetherill Porous Hearth Furnace for making zinc oxide direct from the ore, important innovations in the zinc industry of that day. The town now known as South Bethlehem, Pa., grew up around the zinc business which he founded there, and in fact, for two years bore the name of Wetherill in his honor.

He organized a company of cavalry in Bethlehem, Pa., which became a unit of the Eleventh Pennsylvania Cavalry of which he served as Senior Major throughout most of the Civil War. He was brevetted by an Act of Congress Lieutenant-Colonel, U. S. Volunteers, "for gallant and meritorious service through the campaign of 1864 against Richmond, Va." Until the time of his death in 1890 he was prominent in Masonic circles.

J. Bloomfield Wetherill, a member of the College from 1858 to 1869, received his Ph.G. degree in 1857, using as his thesis subjects Barosma Crenata and Barosma Serratifolia. For a number of years he practiced Pharmacy in Memphis, Tenn., but later turned to the study of Theology, attaining to positions in the Episcopal Church with appointments in Rome, Italy; Newark, New Jersey; and New York City. He died in 1886.

Henry M. Wetherill, Jr., received his diploma as a graduate in Pharmacy with the class of 1872. He went on to the study of Medicine, specialized in the treatment of insanity and became a noted alienist, being appointed to the secretaryship of the Pennsylvania State Board of Lunacy and Charity. He died in 1904.

The present chairman of the Board of Trustees of the Philadelphia College of Pharmacy and Science is Samuel Price Wetherill, Jr., great-great-nephew of the original holder of that office. Our contemporary member of the Wetherill lineage, born in 1880, and whose father attended the College in 1866 until other duties called him elsewhere, is also a chemist, having received the degree of Bachelor of Science from the University of Pennsylvania in 1903. He is president of the Wetherill Engineering Co., and of the Hyper-Humus Company, this latter organization specializing in organic soil-conditioning and fertilizing products the origination of

which were due largely to the company president's knowledge of Chemistry and his heritage of chemical and biological study and achievement.

Civic-minded, and with a sincere belief that interdependence and coöperative human progress is the answer to most of the world's problems, Lieutenant-Colonel Wetherill, who served in France as Major in the Motor Transport Corps during the World War, is an enthusiastic speaker, author and worker for community betterment. It is this unbounded enthusiasm and leadership, this desire for a higher plane of life that caused his election to the College trusteeship in 1921, and his election to chairmanship of the Board, to succeed the late Joseph W. England, in 1934.

Thus the influence of a scientific family, despite the fact that few of them remained long in pharmaceutical practice, is felt in Pharmacy, and especially through pharmaceutical education at the Philadelphia College, for the first chairman of the Board and the present chairman are as one in insisting that standards be kept high, that orderliness and honesty of purpose be foremost, and that professionalism be uppermost in the minds of those who go out into the world through education received at the institution of his administration.

AN ACCOUNT OF THE ATTEMPT OF THE SOCIETY OF APOTHECARIES TO ESTABLISH THE DRUG TRADE IN COLONIAL GEORGIA.*

BY JOSEPH KRAFKA, JR., M.D.[1]

While the Trustees for the establishment of the Colony of Georgia made plans to put the Colony on a self-supporting basis by introducing silk culture, a small group of men, headed by the King's physician, Dr. Hans Sloane, proposed to break the Spanish monopoly on American medicinal plants by introducing these plants locally.

The Spanish drug trade had developed as a result of the efforts of Phillip II, who had sent Hernandez to Mexico in 1570 (1). During his six years' stay he had studied the local flora and later wrote sixteen volumes describing some twelve hundred plants, including those in use by the Indians as medicines, such as: jalap, sarsaparilla, gum copaiba and liquid amber.

Sloane was a man of wide interests. In 1722, he presented the Botanic Gardens at Chelsea to the Apothecaries Company (2). As a young man in 1687 he had been personal physician to the Duke of Albemarle when the latter was Governor of Jamaica (3), and had written at length on the plants of the New World. He had sent some eight hundred plants to Rae in England (4). Being of a pecuniary nature, he was quick to recognize the profit to be made on medicinal herbs and had stocked up on Peruvian Bark before he returned home. As a shrewd manipulator, he enlisted the interests of the Apothecaries Company in his scheme, since the latter controlled by royal charter the sale of drugs in and around London, and had a monopoly of sales to the Army and to the East Indies Company (5).

Sloane, while not on the Board of Trustees for the Colony of Georgia, was commissioned to collect money for this worthy cause (6). His contributions, how-

* Presented before the Section on Historical Pharmacy, A. PH. A., Atlanta meeting, 1939.

[1] Univ. of Georgia School of Medicine.

ever, were for a specific purpose, namely to pay the salary of the Trust botanist whose duty it was to search Spanish territory and secure and transplant to Georgia valuable medicinal herbs (7).

The first appointee to the position of botanist to the Trust was Dr. Wm. Houston of Edinborough. He began his tenure by sending vines from Madeira, but he died shortly after without accomplishing anything further. Dr. Sloane recommended "in his room" Robert Miller, a botanist of note and a recent member of the Royal Society of London. This appointment was approved by the Duke of Richmond, the Earl of Derby, Lord Petre and a Mr. Dubois, all of whom agreed to continue their subscriptions (8). Robert Miller was the brother of Joseph Miller, gardener and warden of the Chelsea Gardens (9).

Miller (or Millar) began his work with enthusiasm. En route to Jamaica he sent over two papers of Egyptian kali or potash seeds, one tub of white mulberry plants, one tub Burgundy vines, one olive tree from Venice, two gallons of Lucerne seeds (heart trefoil), fifty caper plants and one tub of madder root. From the West Indies he sent one paper of cotton seed. Additional importations, presents from the East Indies Company, were barillo seeds and one tub of bamboo shoots (10).

In 1735, Miller wrote from Kingston that he had ipecacuanna plants, balsam of papriva (evidently balsam of copaiba) and tolu trees (11). There is no record however that these plants ever reached Georgia. In another letter to the Trust, Miller promised that he would make every effort to secure jalap, sarsaparilla and contrayerva. The latter was an herbal of wide use as a diaphoretic in fevers, introduced by Francis Drake in 1581.

Miller's[1] first efforts seem to have been local. He made one trip to Florida but he wrote that the Spaniards would not let him search for herbs. In fact he met official opposition at every turn. This, of course, was to be expected since the British smugglers and buccaneers were making serious inroads on the general Spanish trade. The Assiento Treaty of Utrech allowed traders of the South Sea Company but one ship load of cargo each year from a Spanish port, but bribery and piracy undermined the regulations and led to much official ill will (12).

In desperation, Miller appealed to his patron, the Duke of Richmond, to obtain for him a license to search direct from the Court of Spain. It would be difficult to understand such a request, unless it be remembered that King Phillip held twenty-five per cent of the stock of the South Sea Company and was willing enough to help out his British friends if his private interests were furthered at the same time. At least, in 1737, the Duke of Richmond obtained a permit from the Spanish king, addressed as an order to Lord Don Joseph Vizarron, Bishop and Vice Governor of Mexico (13).

Armed with this document, Miller set out from Jamaica on the snow, St. Thomas, a South Sea Company ship. He put in at Porto Bello and went overland to Panama. The local factor "promised him everything" but like other agents he was unable to obtain anything but a few seeds which Miller sent at once to his brother in Chelsea (14).

[1] An argument prevailed in 1820 between Barton and Nuttall as to whether or not the root of a plant indigenous to Georgia and Florida was true jalap, *Ipomœa macrorhiza*. It seems that the form sent to Kew Gardens by Houston was not the proper species. (American Dispensatory, page 226.)

Miller next made a trip to Carthagena and Mompom in search of more ipecacuanna and gum copaiba. But again he returned empty-handed. His third major trip took him to Campeche for contrayerva. On board he heard that he might get lac cochineal at Vera Cruz. When he arrived at the latter port, he presented his letter from the Court of Spain. But the local authorities became suspicious and ordered him "restrained on board." He complained to the local factor but for all of his protests he was sent back to Havana a virtual prisoner. The captain of the Spanish ship took pity on him and put him aboard an English vessel enroute to Jamaica. In 1738 he wrote to the Trust for orders inquiring whether he should return direct to England or take the few plants which he had to Georgia. In 1740 he died in England from a lingering fever contracted while in Spanish territory. In his last letters from Mexico he wrote that he had suffered from the severest sickness, including all forms of the fever, Quotidian, Tertian and Quartan. He ended his dismal reports by saying "there is no getting the Jesuit's bark" (15).

Subsequent history has shown that he was right. No one succeeded in breaking the Spanish monopoly on Peruvian Bark as long as Spain remained a dominant power. Grown in the Loja district in Ecuador, used locally by the Indians, introduced into Spain between 1632–1640, it became the principal remedy for practically all fevers. In 1852, Ledger, after offering his stock of plants to an indifferent English government, sold out to the Dutch and a profitable trade in quinine became a practical monopoly in Java (16).

Nor did the Spaniards lose control of the trade in cochineal. In 1735 it was the principal red dye. Eight hundred thousand pounds of dry insect scale was scraped from the prickly pear in Mexico and sold in Europe for fifteen million francs. The Spaniards maintained their monopoly by the death penalty. In 1776, Thiery de Menonville, after surreptitiously studying the culture in Mexico, succeeded in smuggling a stock which he established in the public gardens of Port au Prince. Both the plants and insects grew slowly, and Thiery, impoverished by his enterprise, died of a broken heart. Twenty years later, following the revolution of the negro emperor, Toussaint l' Ouverture, the surviving cacti and cocci increased to such numbers as to become a public pest. But by this time cochineal and Turkey red (madder root) had lost their importance in dyeing and in Pharmacy (17), (18).

In this connection it is of interest to examine the Colonial Records regarding a report of a local species of cochineal. Captain Dymond, shipmaster, trading in Georgia during the early days of settlement, was interrogated by members of the Trust and claimed to have seen the insect on cacti growing locally (19). He stated that when they were crushed they gave a permanent red color to the fingers. In a report to Parliament the Trustees wrote "there is sufficient evidence to show the reasonable expectations of future benefits to Great Britain for the natural fitness of the soil and climate of Georgia to produce silk, wine, indigo and cochineal." They further considered a proposition by the two Jews, Nunez and Belanger, who asked for a grant of two thousand pounds sterling to develop the trade in Georgia (20).

The United States Department of Agriculture,[1] however, has no record that

[1] A second successful attempt to transplant coccinella was made by Capt. Nelson in 1795 who introduced the plant and insect into East Indies. It is also interesting to note that Ralph Peale claims to have seen native cochineal at Little St. Simons, an island off the coast of Georgia. (American Dispensatory. Second Edition, 1822, page 204.)

either the coccus or the cactus is indigenous to Georgia. Nopalia coccinelifera, the Mexican cactus, is an Opuntia, some species of which grow wild in Georgia (21).

But to conclude our account, with the death of Miller and the war with Spain in 1740, the Apothecaries Company lost interest and withdrew further subscriptions to "promote agriculture in Georgia." The legal question even arose as to whether the Trustees were responsible for the last payments on the salary of the botanist, and with this further importations were abandoned. Limited consignments of native drugs, however, were sent to England, including snake root, sea-rod, china root, sassafras and sumac. All of these had local reputations as curative agents. Snake root was widely used in pleurisy after a report by Dr. Tennet, 1736, of Virginia. China root, a probable substitute for sarsaparilla, was found in and around Savannah by Dr. Twiffler, apothecary surgeon at Ebenezer (22). Pink-root (Spigelia) was used widely as an anthelmintic. Advertisements for quantities occur in the *Georgia Gazette* for the years 1763 to 1770; and as late as 1797 the firm of Montgomery and Bird, of Augusta, offered to purchase unlimited amounts (23). Five comparatively late introductions seem to have been lost to the local drug trade; namely sesamum introduced by the negroes as benne; castor bean; arrow root (Campbell Wylly of Sapello claims to have raised 1480 pounds to the acre); Camphor, growing luxuriantly in Savannah and as far north as Augusta; and lastly *Melia azedarach*, or Pride of India, an ornamental tree whose bark was used as a vermifuge and febrifuge by Kollock of Savannah. (American Dispensatory.)

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(11) *Ibid.*, 21, 68.
(12) Bancroft, G., "History of the United States," 3, 428.
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(18) Cameron, G. C., *Ann. Med. Hist.* 4, 446 (1932).
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(20) *Ibid.*, 2, 252; 4, 315.
(21) Letter to the author (Feb. 12, 1937).
(22) Strobel, P. A., "The Salzburghers and Their Descendents," Kurtz, Baltimore (1855).
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ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1938–1939.

Office of the Secretary, 2215 Constitution Ave., Washington, D. C.

LETTER NO. 11.

August 12, 1939.

To the Members of the Council:

79. Use of Text of the N. F. VI and of the Code of Ethics. Motion No. 29 (Council Letter No. 10, page 549) has been carried with the following members voting in the affirmative: Ke, Dm, La, Fi, Li, Hi, Du, Mo, Ch, Co, Ga, Ho, Je, Co, Sw, Ro, Mi.

The following communications have been received from Chairman DuMez of the Committee on Publications:

"Inasmuch as the American Dental Association has had the privilege heretofore to use for comment the National Formulary VI, I recommend that this privilege again be granted for use in the revised edition of 'Accepted Dental Remedies.'

"In response to your letter of July 28, it is recommended that permission be given Lea and Febiger to quote the A. PH. A. Code of Ethics in the forthcoming textbook on Pharmacy by Stocking and Blome."

(*Motion No. 32*) It is moved by DuMez that the America Dental Association be granted permission to use for comment the text of the N. F. VI with the usual acknowledgment and for value received; and that Lea and Febiger be granted permission to quote the A. PH. A. Code of Ethics in a forthcoming textbook on Pharmacy by Stocking and Blome.

80. Purdue University Student Branch. Motion No. 30 (Council Letter No. 10, page 551) has been carried with the following members voting in the affirmative, and the application and constitution and By-Laws are approved: Ke, Dm, La, Fi, Li, Hi, Du, Mo, Ch, Co, Ga, Ho, Je, Co, Sw, Ro, Mi.

81. Applicants for Membership. The following applications, properly endorsed, accompanied with the first year's dues, and recommended by two members of the ASSOCIATION, have been received:

Nos. 738, Olaf S. Rask, 1924 Mt. Royal Terrace, Baltimore, Md.; 739, Joseph A. Bogard, 3410 Cass St., Omaha, Nebr.; 740, Francis A. Walsh, Missouri Valley, Ia.; 741, Warren Rix, Manning, Ia.; 742, Sister M. Rita Claire Engel, 1406 Sixth Ave. N., St. Cloud, Minn.; 743, Edmond T. Killeen, 419 N. 30th St., Omaha, Nebr.; 744, George F. Bigby, 116 E. Benson St., Anderson, S. Car.; 745, Theodore T. Crews, 159 Forrest Ave., N. E., Atlanta, Ga.; 746, Herman A. Kunz, 501 Wilmington St., St. Louis, Mo.; 747, Carolyn R. Tally, 2510 Seton Ave., Austin, Tex.; 748, Charles R. Whitehead, Ramseur, N. Car.; 749, Kelly E. Bennett, Bryson City Drug Co., Bryson City, N. Car.; 750, Wilbur R. Goodyear, 608 N. 17th St., Harrisburg, Pa.; 751, Leo Stone, 146 Park Ave., East Orange, N. J.; 752, Harry C. Hillhouse, 2716 35th Ave. N., Birmingham, Ala.; 753, Perry McD. Stacy, 4511 Forest Park Blvd., St. Louis, Mo.; 754, Ralph J. Walker, Medical Arts Bldg., Newport News, Va.; 755, Arthur W. Sibbald, 1933 Ivar Ave., Hollywood, Calif.; 756, Margaret J. Watt, 331 Carl St., San Francisco, Calif.; 757, Dr. Kurt E. Steiger, Parkstrasse 47, Wabern, Berne, Switzerland; 758, Robert H. Wyatt, Mayfield, Ky.; 759, Joseph B. Simpson, 4218 Southern Parkway, Louisville, Ky.; 760, Oscar Demling, 3781 Southern Parkway, Louisville, Ky.; 761, Louis S. Ransdell, 106 E. Main, Louisville, Ky.; 762, Otis F. Cook, 1514 Olds Tower Bldg., Lansing, Mich.; 763, J. Ulysse Demers, 418, rue St-Jean, Quebec, Can.; 764, Roger A. McDuffie, 215 S. Edgeworth, Greensboro, N. Car.; 765, William D. Gamble, Merkel Tex.; 766, Warren P. Eldridge, Main St., Safety Harbor, Fla.; 767, Bernard Korn, Carlisle Barracks, Pa.; 768, Edgar A. O'Harrow, 110 S. Indiana Ave., Bloomington, Ind.; 769, Fred Wise, 2229 Valentine Ave., New York City; 770, Adolph Simkunas, 9316 Woodside St., Detroit, Mich.; 771, James R. Robson, 2127 Helen Ave., Detroit, Mich.; 772, James F. Lyon, University Apts. G 2B, Durham, N. Car.; 773, Lawrence J. Carriveau, 3800 W. National, Milwaukee, Wis.; 774, Geo. L. Brown, Onawa, Ia.; 775, Herbert D. Ramsay, 336 S. Gladstone, Kansas City, Mo.; 776, John A. Thompson, 7405 N. Concord Ave., Portland, Ore.; 777, Algernon S. Ernest, 4344 N. Old Domin. Drive, Arlington, Va.; 778, Christopher C. Fordham, Jr., 514 S. Elm St., Greensboro, N. Car.

(*Motion No. 33*) Vote on applications for membership in the ASSOCIATION.

E. F. KELLY, *Secretary.*

PROCEEDINGS OF THE LOCAL AND STUDENT BRANCHES

CITY OF WASHINGTON.—The April meeting was held on the 17th, and the minutes of the March meeting were read and approved.

Reporting for the Treasurer, the Secretary stated that he had turned over $31.00 received as emergency dues and $33.00 received from the A. PH. A., to the Treasurer.

Mr. Reznek, Program Chairman, reported that Mr. A. G. Murray, Chief Chemist for the Food and Drug Administration, would speak at the May meeting on "The New Food, Drug and Cosmetic Act and its Enforcement." It was moved by Dr. Briggs, and seconded, that the Program Chairman be appointed at the May meeting and that the present Chairman carry over until June 1940.

Dr. Lewis G. Waller, speaking on "The Cure of Anemia and Its Relation to the Pharmacist," described in detail the formation or growth of the erithrocytes or red cells, the lack of which cause anemia. These cells are formed in the bone marrow of the ribs and other long bones. From the reticulem cell, a very primitive type, the megaloblast or first cell, the reticuloblast containing no hemoglobin, the cell develops, increasing in hemoglobin content but decreasing in size to the normablast. When the nucleus has disappeared and the hemoglobin has reached its normal level, we have the erythrocyte or normal red cell.

The susceptibility to pernicious anemia begins at middle age and increases with age above forty. It is diagnosed in the laboratory by the increase of megaloblasts in the bone marrow and the suspension of the development of the erithrocytes, a minimum being reached at a red count of 600,000 to 800,000. Liver extract has been found to mature the megaloblasts and is administered orally or intramuscularly. The U. S. P. and the Anti-Anemia Control Board have designated the minimum of potence in the unit system where the unit is the amount required to maintain a patient at a good red count of about 5,000,000.

Other types of anemias are the iron deficiency and hypochromatic, or low-color anemias, where the development of the cell is suspended at the normablast. Other types are due to duodenal ulcers, hemorrhages, thyroid deficiency, lucemias and Hodgkin's disease. Sprue, intestinal disturbances and certain toxic substances such as benzol, benzene and other benzene derivatives are frequent causes of anemia.

Liver extract can be given orally but it requires thirty times as much for an effective dose as when administered intramuscularly. The amount of extract varies with locale. In New England one cc. may be sufficient to hold the count at 5,000,000 when administered every three weeks but this dose will not work in the District of Columbia. Ventriculum, which may or may not contain the active ingredient contained in liver extract, is used in the Middle West but not much in the East. Brewer's yeast when given in four to six ounces daily has been found to be effective in pernicious anemia. X-ray is not effective. Extracts from the pancreas and spleen have been tried but discarded.

Only fresh livers should be used and these should be kept in cold storage but not frozen. Extract prepared from good liver deteriorates only after a year.

KENNETH L. KELLY, *Secretary.*

NORTHWESTERN.—A joint meeting of the Branch and the Scientific and Practical Sections of the Minnesota State Pharmaceutical Association was held at Duluth, Minn., June 28th, 8:30 A.M. to 12:30 P.M., presided over by Dean Charles H. Rogers, chairman of the Section, assisted by Prof. Earl B. Fischer, chairman of the Branch. A large and enthusiastic audience listened to the following program:

1. "Pharmaceutical Literature—Does It Matter?" Charles E. Smyithe and Charles H. Rogers, Dean, College of Pharmacy, University of Minnesota. Read by Mr. Smyithe.
2. "Advances in Pharmaceutical Chemistry," Glenn L. Jenkins, College of Pharmacy, University of Minnesota.
3. Address, "Interprofessional Relationships between Dentists and Pharmacists," Dr. C. E. Rudolph, School of Dentistry, University of Minnesota.

4. Motion Picture Presentation, "The Story of Sulfur."

5. Address, "The Line Forms to the Right," Prof. A. H. Chute, School of Business Administration, University of Minnesota.

6. Address, "The Pharmacist and Public Health," Prof. Wm. O'Brien, School of Medicine, University of Minnesota.

7. Reports by fourteen standing committees of the Section.

8. Presentation of the Minnesota State Pharmaceutical Association scholarship keys to Herbert Cole, Rochester, Minn., for 1938–1939; and to Sam Levine, Minneapolis, Minn., 1939–1940.

A resolution was presented and subsequently adopted by the convention as a whole to devote a full day to this joint session at the 1940 convention.

CHARLES V. NETZ, *Secretary.*

PHARMACY SECTION OF THE AMERICAN HOSPITAL ASSOCIATION.

The program of the annual meeting of this Association to be held in Toronto, September 25–29, 1939, is given in the September issue of *Hospitals*. The Pharmacy Section will meet on Monday afternoon, September 25th. Mr. Worth L. Howard, Administrator, City Hospital, Akron, O., is Chairman; and J. Winfred Tice, M.D., Hamilton General Hospital, Hamilton, Ont., Can., is Secretary.

The Program of the meeting is as follows:

1. "Should the Pharmacy Be Responsible for Drugs and Pharmacueticals Only, or Should It Be Responsible for Medical and Surgical Supplies as Well?" C. W. McClintock, Columbus, Ohio, Director, Laboratory Supply Stores, Ohio State University.

2. "Pharmacy Intern," H. A. K. Whitney, Ann Arbor, Mich., University Hospital.

3. "The Function and Scope of the Pharmacy in the Small Hospital," J. G. Barclay, Belleville, Ont., Pharmacist, Belleville General Hospital.

4. "Manufacturing in the Hospital Pharmacy." (*a*) Large Hospital, L. N. Hickernell, Cleveland, O., Assistant Administrator, City Hospital of Cleveland; (*b*) Small Hospital, Sister M. Immaculata, Antigonish, Nova Scotia, St. Martha's Hospital.

5. "The Use and Abuse of the Hospital Pharmacy," E. L. Harmon, M.D., Valhalla, New York; Medical Director, Grasslands Hospital.

It will be noted that Mr. H. A. K. Whitney, the present Chairman of the Sub-Section on Hospital Pharmacy of the A. PH. A. is to take part in this program. The consideration which the American Hospital Association is giving through this Section, and otherwise, to the improvement of pharmaceutical services in hospitals is most encouraging and helpful.

The Oklahoma State Board of Pharmacy has approved plans for opening a School of Pharmacy in Southwestern State College at Weatherford. Plans for the new school were submitted by Dr. L. J. Klotz, head of the Department of Chemistry of Southwestern, and Albert Eaton, well-known Weatherford druggist. Dr. Klotz, who will head the new course holds a doctor's degree from the University of Florida. Those who are advocating the new school urge that it will offer young people of western Oklahoma an opportunity to study Pharmacy economically.

PERSONAL AND NEWS ITEMS.

The 107th annual meeting of the British Medical Association was held in Aberdeen. The President, Dr. Thomas Fraser, took as a subject for his address, "Forty Years of Practice."

The Ebert Prize, highest award of the AMERICAN PHARMACEUTICAL ASSOCIATION for pharmaceutical research, was presented at the Association's convention in Atlanta to **Dr. B. V. Christensen,** Director of the University of Florida School of Pharmacy. Dr. Christensen, who will take over the directorship of the Ohio State School of Pharmacy, September first, received the award for a paper on "Biological Assaying" presented at the Minneapolis convention in 1938.

The Kilmer Prize, highest recognition for a student of Pharmacy, was awarded to **Guilford C. Gross** of the University of South Dakota School of Pharmacy. It was for a paper entitled, "Study of Red Squill."

Among those who visited the American Institute of Pharmacy, during August, were the following: Kenneth E. Avis, Elmer, N. J.; J. W. Scofield, Shellyville, Ky.; Dr. A. H. Volle, Vincennes, Ind.; Mary L. Funk, New York City; J. C. Mesem, Outwood, Ky.; Mary E. Stuart, New Orleans, La.; C. T. Abrilat, Washington, D. C.; Enrique A. Gonzalez Flores, Ponce, P. R.; L. D. Havenhill, Lawrence, Kans.; E. B. Stringham, Shafter, Calif.; Cornelius Rohrer, Parlier, Calif.; V. A. Rohrer, Parlier, Calif.; Raymond P. Borawinski, Chicago, Ill.; H. George DeKay, W. LaFayette, Ind.; Marjorie M. Nelson, Baker, Ore.; Wm. W. Wrigley, St. Augustine, Fla.; C. B. Allison, Dallas, Tex.; G. K. Smith, Washington, D. C.; John V. Painter, Washington, D. C.; George A. Wilson, Washington, D. C.; George A. Mangs, Springfield Gardens, N. Y.; Jesse E. Davis, Roanoke, Va.; Will T. Head, Jr., Terry, Miss.; H. S. Johnson, New Haven, Conn.; Alice Quinn, Washington, D. C.; Mazel Hinckley, Belmont, Mass.; Mr. and Mrs. F. U. LuBott, Belnord, Mass.; P. Duderstadt, Chicago, Ill.; Ike Reabig, Chicago, Ill.; A. L. Rivard, Lewiston, Me.; Charles F. Gilson, Providence, R. I.; Leo C. Clark, Providence, R. I.; H. Kuo, Iowa City, Iowa; C. T. Li, Iowa City, Iowa; Chi-Chuan Shen, Shanghai, China; M. Szymczyk, Cleveland, O.; Henry Szymczyk, Cleveland, O.; G. T. Hen, Ann Arbor, Mich.; Joseph Szymczyk, Cleveland, O.; K. T. Chad, Ann Arbor, Mich.; E. C. Severin, Philip, S. Dak.; Rose Hacy, Chapel Hill, N. C.; George P. Wilson, Columbus, O.; Helen Blank, Cleveland, O.; Morris Harrison, Collingswood, N. J.; Eugene Youngken, Boston, Mass.; Dr. and Mrs. Heber W. Youngken, Boston, Mass.; Daniel D. Tanjec, Cleveland, O.; John F. Miller, Cleveland, O.

Dr. A. G. DuMez, secretary-treasurer of the American Council on Pharmaceutical Education, announced that a list of accredited Pharmacy Schools will be published on or about January 1, 1940. Fifty of the sixty-one Colleges of Pharmacy which have applied for accreditment have been inspected; the remaining schools will be inspected this fall as early as possible.

A Conference of state pharmaceutical leaders is contemplated for early fall, in Seattle, Washington, to consider revision of the state pharmacy law; the Board of Pharmacy, deans of both Schools of Pharmacy, and officers and board members of the ASSOCIATION, will attend.

The Wisconsin Pharmaceutical Association met on September 19th–21st, in Milwaukee, for its annual convention, which was one of the most out-standing events in the history of the association. The entertainment was most enjoyable and the business and professional sessions worthwhile. Among the speakers were: Harry S. Noel, Eli Lilly & Co.; Herbert W. Adkins, vice-president of Yahr-Lange, Inc.; Dr. R. W. Clark, formerly secretary of the Wisconsin Pharmaceutical Association and now of Merck & Co., Rahway, N. J.; I. H. Bander of McKesson & Robbins. Dr. Arthur Uhl conducted a professional clinic which was even better than usual this year. In addition to the regular drug show there was one of cosmetic and toiletry goods.

Mr. J. W. Gayle, for fifty years secretary of both the Kentucky State Board of Pharmacy and the Kentucky State Pharmaceutical Association, was elected Honorary President of the AMERICAN PHARMACEUTICAL ASSOCIATION at its convention in Atlanta. Mr. Gayle joined the ASSOCIATION in 1891.

OBITUARY.

ERNEST STAUFFEN.

Ernest Stauffen, former vice-president and managing director of Sharp & Dohme, Inc., retired in 1929, after being with the company for fifty-four years. On August 27, 1939, Mr. Stauffen passed away at his home in Pocono Manor, Pa., aged eighty-five years. He had been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1916.

Mr. Stauffen was born in Hanover, Germany, and came to this country in 1872. He graduated from the University of Maryland and in 1875 began his business career with Sharp & Dohme, Baltimore, Md. In 1895 Mr. Stauffen was named vice-president and in 1906 managing director as well.

Mr. Stauffen is survived by two sons, Ernest, of Englewood, N. J., and Ralph, of Montclair, N. J.

BOOK NOTICES AND REVIEWS.

Pharmacie Galenique, by A. GORIS, Professor of Galenical Pharmacy and of the Faculty of Paris and Director of the Central Pharmacy Hospital and Member of the Academy of Medicine, and A. Liot, associated for many years with the former in the Central Pharmacy of the Hospitals of Paris. Volumes I and II. Masson et cie, Editeurs of Libraries of the Academy of Medicine, 120 Boulevard Saint-Germain, Paris.

The first chapter of Volume I considers the history of pharmacy, of earlier periods, including the development of the sciences, the association with medicine, the regulations and institutions and creation of pharmaceutical formulas, libraries, studies of antidotes, poisons, formularies, dispensatories, etc.

Further chapters deal with vegetable drugs, their composition, the chemicals, oils, their physical and chemical composition. There are few errors, which have been carried forward from other publications. Consideration is given to preparations including tablets, pastilles. The volumes are interestingly illustrated. The index for both volumes is given at the end of the second volume. Volume I contains 900 pages; Volume II more than 1000 pages. The chapters of the latter include medicaments prepared by solution and evaporation, the ferments, organic therapeutics, serums, bacteriologics, preparations for internal and external uses, incompatibles, sterilization, disinfectants, preservation, etc. While the work is primarily for French pharmacists, there are discussions which make it of value to the libraries of schools of pharmacy. Professor Goris and associate are acquainted with American pharmacy and the work will be welcomed by researchers and those engaged in related efforts in other countries. The books are well bound, the typography and illustrations are good. Price, 450 fr.

Lange's Handbook of Chemistry. Compiled and edited by NORBERT ADOLPH LANGE, Ph.D., assisted by Gordon M. Forker, with an appendix of mathematical Tables and Formulas by Richard Stevens Burington, Ph.D. Third Edition, revised and enlarged. Published by Handbook Publishers, Inc., Sandusky, O., 1939. Price, $6.00; bound in buckram; if payment is enclosed the name will be stamped on cover, but book cannot be returned.

An abridged Table of Contents includes among many other lists the following: Atomic Weights and Numbers, Periodic Table, Description of Each of the Elements, of 2500 Compounds, Common Trade Names of Chemicals, etc., Definitions of Chemical Terms, Laboratory Arts and Recipes, Factors for Reducing Gas Volumes.

The methods make this a self-defining handbook. Tables cover the mathematical calculations. The Handbook has become established and is of value to chemists, pharmacists, physicists, mineralogists, engineers, librarians, attorneys, dieticians, manufacturers, laboratorians. The publishers will supply copies of the abridged Table of Contents or order a copy of the book for examination; this may be returned at the publishers' expense. Preceding editions have found favor; this edition has been carefully revised and enlarged.

Medical Jurisprudence, and Toxicology, by JOHN GLAISTER, M.D., D.Sc., Prof. of Forensic Medicine, University of Glasgow. Sixth Edition, 1938. 747 pages; 107 illustrations. Published by The Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, Md. Price, $8.00.

THE HENRY WELLCOME MEDAL.

ASSOCIATION OF MILITARY SURGEONS UNITED STATES.

The Wellcome Gold Medal and cash prize of $500.00 awarded annually by the Association of Military Surgeons of the United States, was established in 1916 by the late Sir Henry Wellcome with the endorsement of the Council of the Association. The Gold Medal, which was designed by Sir Henry Wellcome, bears on the reverse a representation of the seal of the Association of Military Surgeons of the United States. On the obverse are the heads of Mechaon and Polaleirios, Homer's "two famed surgeons" of the Greek army in the Trojan War.

The Medal, together with the cash prize, is awarded annually "for researches, discoveries, inventions, designs, improvements, assays or any other acts or deeds which the Executive Council of the Association may consider desirable and helpful to the objects of the Association, and relating to any phase of medico-military affairs and disease control associated with the Army, Navy, Militia and Public Health and Marine Hospital Service in times of peace or war at home or abroad."

Announcement of the annual competition is published each year in the official organ of the Association, *The Military Surgeon*. The award is made for the best paper on a subject assigned each year in the published announcement. Particulars as to the assigned subject and the requirements to be met in submitting papers may be obtained by addressing the Secretary of the Association of Military Surgeons of the United States, Army Medical Museum, Washington, D. C.

The competition is open to any member of, or person eligible for membership in the Association of Military Surgeons of the United States. Active membership in the Association is open to: (*a*) those who are, or have at any time been, commissioned officers in the Medical Department (or Service) of the Army, the Navy, the U. S. Public Health Service, the National Guard, the Organized Reserve, the U. S. Volunteers and Acting Assistant or Contract Surgeons of these Services; (*b*) regularly appointed members of the Medical Service of the Veterans' Administration and those who have been such; (*c*) those who have been duly elected members of the Air Service Medical Association and of the Medical Veterans' of the World War; (*d*) officers of the Military Medical Service of other countries.

All competitors who are not already members of the Association and who can qualify under any of the foregoing classifications, are eligible to membership, and the Executive Council hopes that they will exercise their privilege and join the Association.

COURSE FOR PHARMACY TECHNICIANS.

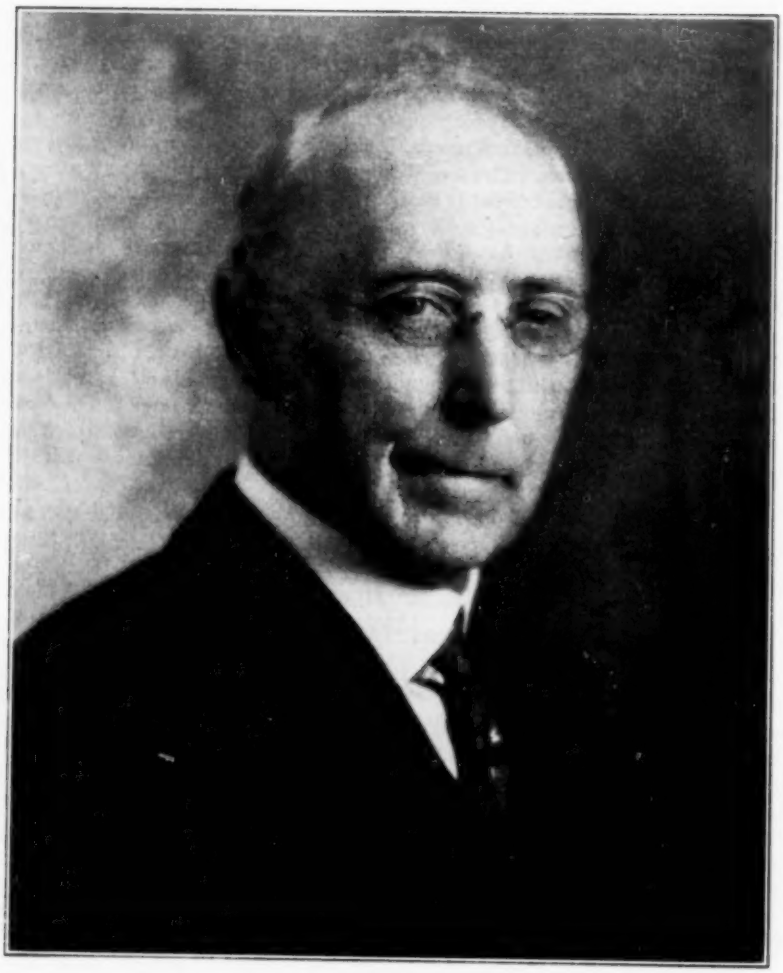
This course is being given at the Army Medical School, Army Medical Center, Washington D. C., and the purpose is to train enlisted men for duty as enlisted assistants in pharmacies of station and general hospitals and medical regiments. The following subjects are offered:

Chemistry, Bacteriology, Mathematics and Physics, Pharmacognosy, Dispensing Pharmacy, Pharmacology, Medical Department Supply Catalog and Pharmacy Administration. The instruction is given by Lieutenants G. K. Smith, J. V. Painter and G. H. Wilson, who are pharmacists, with the exception of Bacteriology, which is given by Capt. A. R. Dreisbach of the Bacteriology Department.

The course covers nine months and a total of 1374 hours of instruction will be given. Applicants for the course must have at least a High School education or its equivalent and about twenty-five carefully selected enlisted men from all over the United States are taking the first course which began on September 15th.

RESEARCH AWARD.

Mr. Kenneth P. DuBois has been selected as the recipient of the fellowship grant of $400.00 recently made to the School of Pharmacy, Purdue University, by the AMERICAN PHARMACEUTICAL ASSOCIATION, for the study of antioxidants in extractive preparations of tannin-bearing drugs. Mr. DuBois is a graduate of the School of Pharmacy, South Dakota State College, and has been engaged recently in research at that School. He will spend the next ten months in the study of substances which may prevent the oxidation affecting astringent preparations. One of these is the new Liquor Acidi Tannici.



JOHN WILLIAM GAYLE.